THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIII. No. 570.] LONDON, APRIL 14, 1874. [26TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—10,000 cubic feet of gas per ton of coal; 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1838. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 80, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
Address G. H. RAMSAY, NEWCASTLE-ON-TYNE.

GENUINE TORBAY PAINT
AND
ANTI-GALVANIC PAINT.
FOUR PRIZE MEDALS.
WORKS: BRIXHAM, TORBAY.
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.
STEVENS AND CO.,
London Office, 21, Great Winchester Street, E.C.

HENRY SKOINES,
PATENTEE & CONTRACTING GAS ENGINEER FOR
SETTING RETORTS,
ERECTING AND REMODELLING GAS-WORKS OF ANY EXTENT,
AT HOME OR ABROAD.
ADDRESS—
7, ARGYLE ST., KING'S CROSS, LONDON, W.C.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and OTHER OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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JOS. COWEN & Co. are the only Manufacturers of FIRE-BRICKS and CLAY RETORTS at BLAYDON BURN.

JOHN RUSSELL AND CO.,
THE OLD TUBE-WORKS, WEDNESBURY
AND
THE ALMA WORKS, WALSALL.
Established at the commencement of Gas Lighting.
WAREHOUSES:
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16, SOHO SQUARE,
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35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
J. R. and Co. are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
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JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
ESTABLISHED 1830.

THOMAS PIGGOTT & CO.,
SPRING HILL, BIRMINGHAM.
MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
SUGAR, SALTPETRE, AND ALL KINDS OF PANS.
Roofs, Girders, and Bridges, and General Smith's Work.
LONDON AGENT—W. G. DAVIS, 2, Brabant Court, Philpot Lane, E.C.

SCOTTISH CANNEL COAL.
J. & W. ROMANS, Consulting Gas Engineers and Coal Factors, of Edinburgh and London, CONTRACT for supplying any quantity of COAL and CANNEL.
They are also Contractors for leasing Gas-Works, for supplying, erecting, or repairing gas apparatus and fire-clay goods.
Messrs. ROMANS, being lessees of several Gas-Works, have their Cannels tested in the ordinary working process, thus securing for their customers a guarantee beyond mere laboratory experiments.
Analysis, prices, and other information will be forwarded on application to their Offices, 8, Forth Street, EDINBURGH; 1, Walbrook, Mansion House, LONDON, or to the "Crown Wharf," Thomas Street, Limehouse, LONDON, where stocks of house, steam, and gas coal are always on hand.
Coal, machinery, fire goods, &c., shipped to all parts of the world.

THE
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.

AGENT:
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GEORGE GLOVER & CO.,

PATENTEES OF
NATIONAL STANDARD GASOMETERS
For the English Government, and for the Government of the Netherlands;
MAKERS OF THE DUPLICATE COPY
Presented by Her Majesty's Government to the French Government;
AND MANUFACTURERS OF
IMPROVED
DRY GAS-METERS,
Warranted to Measure correctly, and not to vary.
RANELAGH WORKS, RANELAGH ROAD, PIMLICO, LONDON, S.W.;
236, GEORGE STREET, GLASGOW; AND 15, MARKET STREET, MANCHESTER.

G. G. and Co. have just received the only Medal awarded for Gas-Meters at the Vienna International Exhibition.

SILVER MEDAL, PARIS EXHIBITION, 1867.

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ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES AND FITTINGS

AND

LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

London Offices: No. 4, Cloak Lane, Queen Street, E.C.

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LIVERPOOL: No. 63, Paradise Street. | PARIS: No. 38, Rue du Chateau d'Eau.

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(ESTABLISHED IN 1765,)

BOILER AND GASHOLDER WORKS,

Westbromwich, near Birmingham.

MANUFACTURER OF TELESCOPE AND SINGLE GASHOLDERS,

WROUGHT & CAST IRON TANKS

FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS,

And all kinds of GAS APPARATUS.

Wrought-Iron Roofs, Bridges, and Girders; Steam, Hot Water, and Range Boilers; Tanks, Cisterns, &c.,

And all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, and ESTIMATES FURNISHED.

LAMBERT BROTHERS, WALSALL.

ALPHA TUBE & FITTING WORKS

HENRY HOWARD & CO.,

COOMBS WOOD PATENT TUBE-WORKS.

OLD HILL, near DUDLEY,

MANUFACTURERS OF

HOWARD'S PATENT IMPROVED WROUGHT-IRON TUBES,

FOR GAS, STEAM, AND WATER;

Also ORDINARY WELDED WROUGHT-IRON TUBES and FITTINGS,

FOR GAS, STEAM, & WATER, EITHER BLACK, GALVANIZED, OR ENAMELLED.

CORE BARS FOR IRONFOUNDERS, STOCKS, TAPS, AND DIES, IRON COCKS, &c.

London Agent—W. G. DAVIS, 2, Brabant Court, Philpot Lane, E.C.

LIME SUPERSEDED

IN THE

PURIFICATION OF ILLUMINATING GAS,

BY

Spence's Patent Dry Copperas,

The only Purifying Material which removes, by one process, all Ammonia and Sulphuretted Hydrogen. It has been in use for upwards of four years at some of the largest Gas-Works in the Kingdom.

TESTIMONIALS SENT ON APPLICATION.

SPENCE BROTHERS CHEMICAL COMPANY, LIMITED,

VICTORIA CHEMICAL WORKS, ASHTON NEW ROAD, BRADFORD, MANCHESTER,

Manufacturers of SPENCE'S PATENT DRY COPPERAS; GREEN COPPERAS;

SPENCE'S PATENT GAS DEODORIZER;

SULPHATE OF AMMONIA, GREY AND BROWN; SULPHURIC ACID; MUDIE'S DISINFECTANT, &c.

CONTRACTORS FOR THE PURCHASE OF SPENT OXIDE.

ALL COMMUNICATIONS TO BE ADDRESSED TO THE WORKS.

GAS PURIFICATION & CHEMICAL Co., LIMITED,

(Successors to JOHN WILLIAM O'NEILL & CO.,)

Offices—PALMERSTON BUILDINGS, OLD BROAD STREET, LONDON, E.C.,

CONTRACTORS FOR GAS PURIFICATION BY OXIDE OF IRON.

The superiority of the material supplied by this Company is generally recognized, and it is now in use in nearly all the London and most of the large Provincial Gas-Works.

JOHN WILLIAM O'NEILL,
SAMUEL H. JOHNSON, } Joint Managing Directors.

JOSEPH AIRD,

WELLINGTON TUBE-WORKS,

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MANUFACTURER OF

PATENT WELDED WROUGHT-IRON GAS, STEAM, HYDRAULIC, GALVANIZED, & ENAMELLED TUBES & FITTINGS.

Established

1795.

JOSEPH CLIFF & SON,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

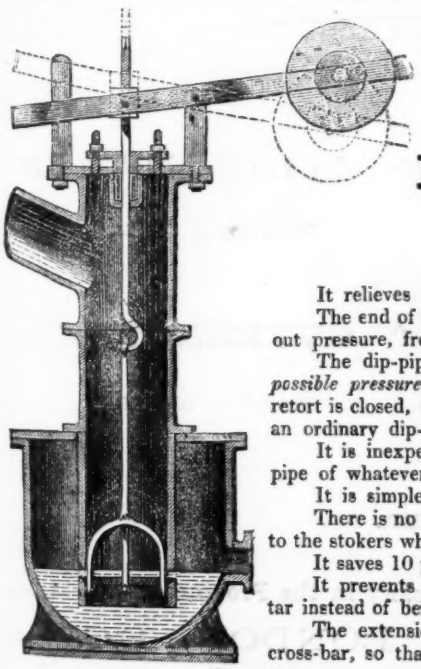
FIRE GOODS, and Salt-Glazed Drain-Pipes.

LONDON WHARF:

Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.



CAFFALL, THOMAS, AND CO.,

LIMITED.

PATENT IMPROVED SEAL

FOR

GAS HYDRAULIC MAINS.

It relieves the retorts from all pressure during the time gas is being made.

The end of the dip-pipe not being immersed in the tar, permits the gas to pass freely, and without pressure, from the retort into the hydraulic main.

The dip-pipe can be effectually sealed without trouble, to resist the back rush of gas, *to any possible pressure*, during the time of charging; but in the event of the Seal being left on, after the retort is closed, no inconvenience is caused, as the piece of pipe used as the Seal only lengthens it to an ordinary dip-pipe.

It is inexpensive, and can be easily and readily applied to any existing hydraulic main and dip-pipe of whatever shape or size, at a trifling cost.

It is simple in its arrangement, and cannot get out of order.

There is no deposit of carbon on the top of the retort, thereby saving considerable time and trouble to the stokers when drawing and charging, also the injury caused by scurfing the retort is avoided.

It saves 10 per cent. of the coal carbonized; also the same proportion of fuel, retorts, labour, &c.

It prevents the thickening of the tar in the hydraulic main, as the heated gas passes *over* the tar instead of being forced *through* it.

The extension piece of pipe is moved by a lever, from which hangs a $\frac{3}{8}$-inch rod, hooked on the cross-bar, so that the lid of the retort cannot be struck without first sealing the pipe.

Every information can be obtained, and Models seen, at the Offices of the Company,

28, GRACECHURCH STREET, LONDON, E.C.

THE IMPERIAL METER COMPANY, LIMITED,

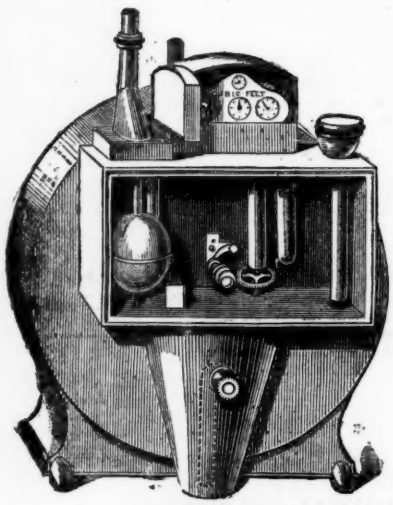
MANUFACTURERS OF

WET AND DRY GAS-METERS,

PRESSURE-GAUGES AND GOVERNORS, AND STREET-LAMP REGULATORS.

FACTORIES:

KING'S ROAD, LONDON, N.W., and GRAY'S INN ROAD, LONDON, W.C.



Front View.

THE

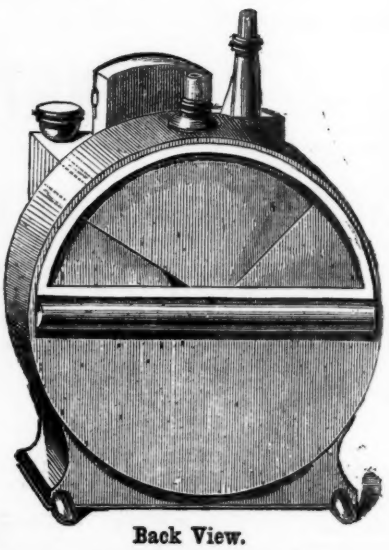
IMPERIAL

COMPENSATING

WET GAS-METER.

DE CASTRO & BURTON'S

PATENT.



Back View.

I. This Meter is more simple in construction than the common non-compensating Meter.
II. An unvarying water-line is maintained.
III. No amount or kind of pressure will cause it to "flood."
IV. It is practically unaffected by "tilting."
V. The friction is less than in any other Meter; and
VI. It will last for twelve months without requiring to be refilled.

THE IMPERIAL METER COMPANY, LIMITED, ALSO MANUFACTURE COMMON NON-COMPENSATING WET GAS-METERS OF ALL SIZES, BOTH IN TIN AND CAST-IRON CASES.

SPECIAL ATTENTION

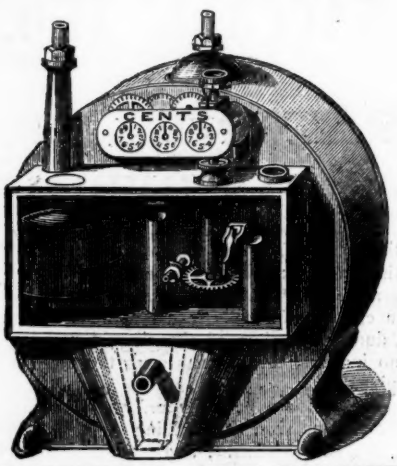
IS PAID TO THE

MANUFACTURE OF

STREET-LAMPS

AND

REGULATORS.



THE IMPERIAL WET GAS-METER.
Non-Compensator.

STATION-METERS

WITH PLANED JOINTS,

AND

GOVERNORS,

MADE TO ORDER.

Mr. GEORGE MACKANESS will represent this Company in the Provinces.

OFFICES: 41, FLEET STREET, LONDON, E.C.

W. MOORE, Secretary.

☞ *All Communications to be addressed to the Secretary.*

WILLEY AND FORD,

GAS ENGINEERS,

WORKS: COMMERCIAL ROAD, EXETER,

INVITE THE ATTENTION OF GAS COMPANIES AND OTHERS FOR THE SUPPLY OF

EVERY DESCRIPTION OF GAS APPARATUS.

ENGINEERING DEPARTMENT.

NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

GASHOLDERS AND TANKS.

RETORTS and RETORT-HOUSE FITTINGS, CONDENSERS, SCRUBBERS, ENGINES and EXHAUSTERS, PURIFIERS, STATION-METERS, GOVERNORS, VALVES, &c.

METER DEPARTMENT.

They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

GAS-FITTING DEPARTMENT.

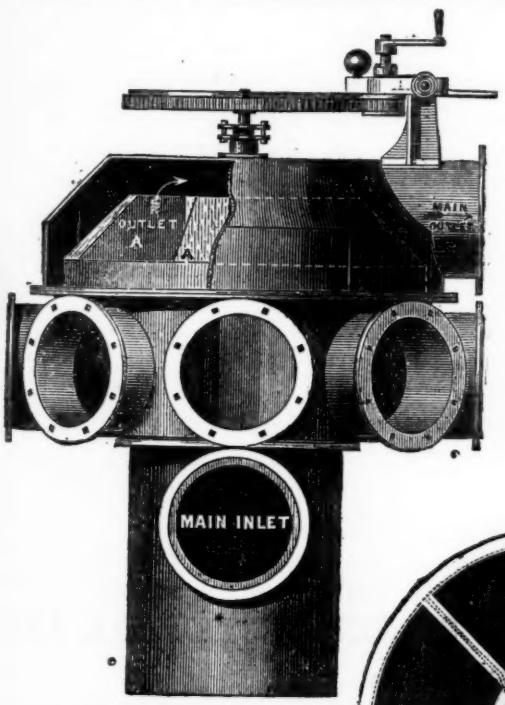
An extensive variety of Choice Designs in CHANDELIERS, PENDANTS, BRACKETS, STAR and SUN LIGHTS, MEDIÆVAL FITTINGS for CHURCHES, &c.

PATTERN-BOOKS and PRICE LISTS furnished.

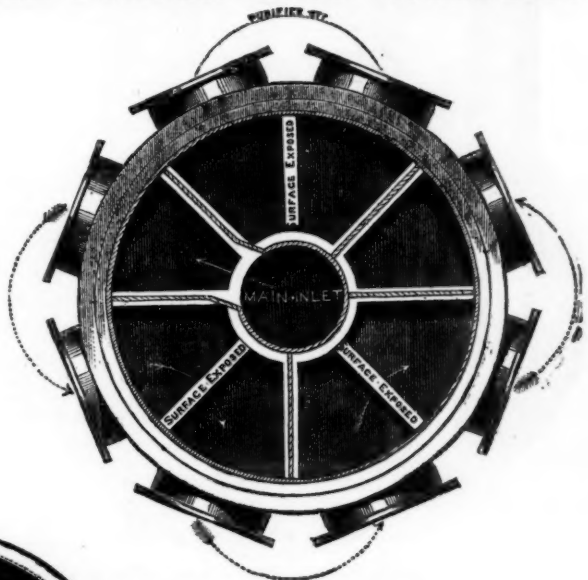
☞ PLEASE NOTE THE ADDRESS—

GAS ENGINEERING WORKS, COMMERCIAL ROAD, EXETER.

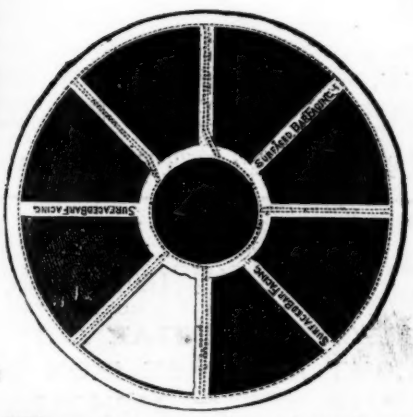
C. & W. WALKERS' DOUBLE-FACED GAS-VALVES.



evation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.



Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)



Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.

MIDLAND IRON-WORKS, DONNINGTON, near NEWPORT, SHROPSHIRE; 8, FINSBURY CIRCUS, LONDON.

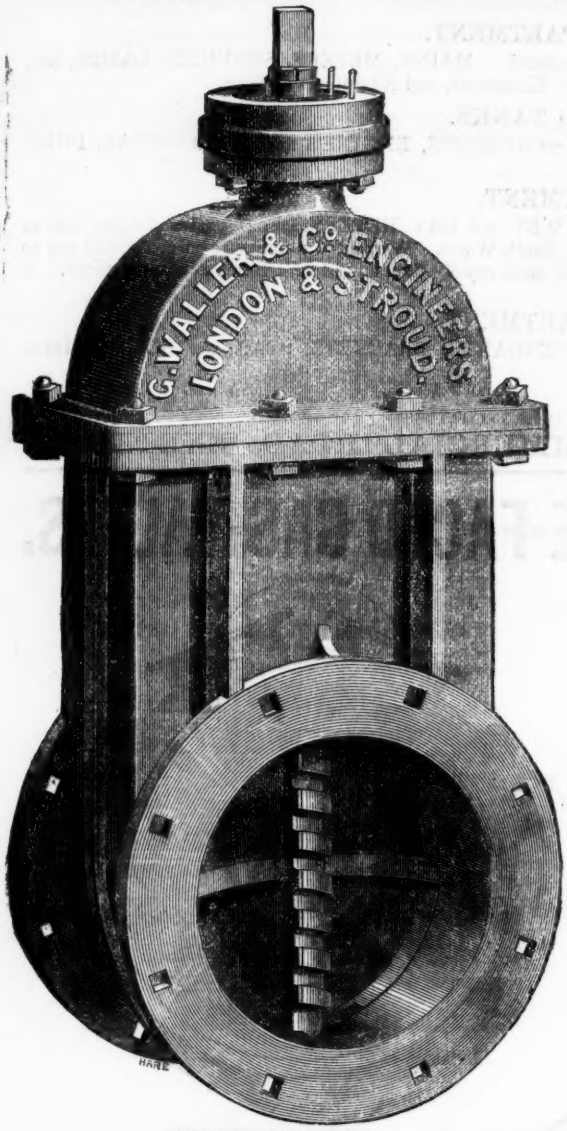
GEORGE WALLER & CO.,

GAS ENGINEERS AND CONTRACTORS,

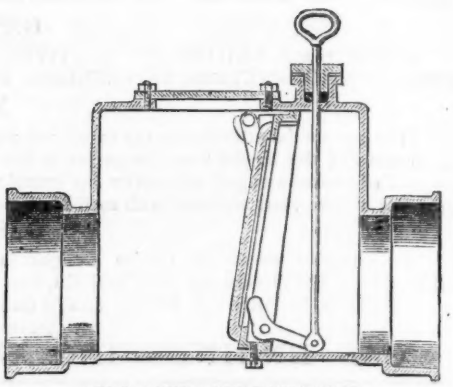
MANUFACTURERS OF

BEALE'S IMPROVED PATENT GAS-EXHAUSTERS,

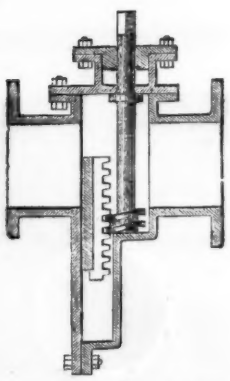
COMBINED ENGINES AND EXHAUSTERS,



IMPROVED GAS-VALVE



SELF-ACTING BYE-PASS VALVE.



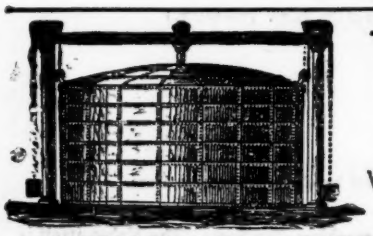
HYDRAULIC MAIN VALVE.

PUMPS, VALVES (2 in. to 30 in.), HYDRAULIC REGULATORS, ENGINES, &c., in STOCK.

PHŒNIX ENGINEERING WORKS, HOLLAND STREET, SOUTHWARK, S.E.,

AND AT

STROUD, GLOUCESTERSHIRE.



W. C. HOLMES & CO.,

WHITESTONE IRON-WORKS, HUDDERSFIELD

MANUFACTURERS OF

RETORTS, ANNULAR AND PIPE CONDENSERS,

WROUGHT AND CAST IRON SCRUBBERS, PURIFIERS,

GASHOLDERS,

GOVERNORS, AND ALL THE NECESSARY FITTINGS FOR COMPLETING THE ERECTION OF GAS-WORKS.

STATION & CONSUMERS WET OR DRY METERS, STREET & SERVICE MAINS, LAMP COLUMNS & BRACKETS, & WROUGHT-IRON TUBES AND FITTINGS; WROUGHT-IRON ROOFS FOR ANY SIZE OF BUILDINGS.

Sole Makers of B. W. Thurston's Combined Condensing, Scrubbing, and Washing Apparatus,

AND PATENTEES OF THE IMPROVED COMBINED CONDENSING AND PURIFYING APPARATUS SO EMINENTLY ADAPTED FOR EXPORTATION.

REFERENCES TO UPWARDS OF 800 GAS-WORKS.

TANGYE BROTHERS AND HOLMAN,

LAURENCE POUNTNEY LANE, LONDON, E.C.,

SOLE MAKERS OF

MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

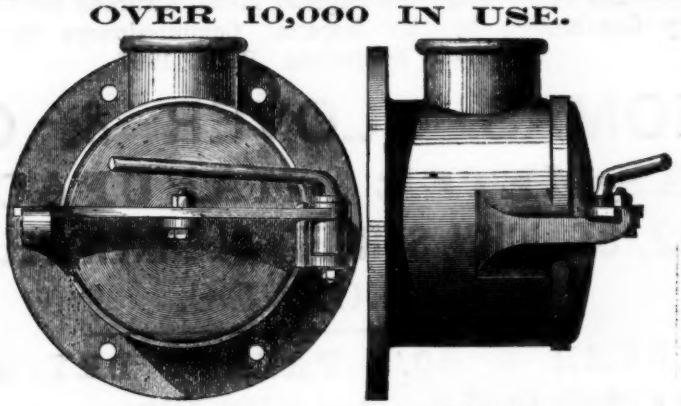
HOLMAN'S PATENT ECCENTRIC FASTENINGS.

OVER 10,000 IN USE.

NO LUTING.

LIDS HINGED TO MOUTHPIECES; NO LIFTING ON OR OFF.

NO SCREWS FOR FASTENING.



FRONT VIEW. SIDE VIEW.

SIMPLE.

ECONOMICAL

DURABLE

EFFECTIVE.

NO DUPLICATE LIDS REQUIRED.

These Lids are proved by many eminent Gas Engineers to be the most efficient, saving much time, labour, and expense; are opened and closed as quickly and with as little trouble as an ordinary furnace door, and by their use the Retorts are soundly sealed during the whole period of carbonization.

These Lids are Adopted by the following (among many other) Gas Companies:—

The Gaslight Company, Beckton (where over 2000 are in use).
" Gaslight Company, Bow Common.
" London Gaslight Company.
" Independent Gaslight Company.
" Phœnix Gaslight Company.
" South Metropolitan Gaslight Co.
The West Ham Gas Company.
" Imperial Gaslight Company.
" Gas-Works, Arsenal, Woolwich.
" Commercial Gas Company.
" Alliance and Dublin Gas-Works.
" Edinburgh Gas-Works.
" Manchester Corporatn. Gas-Works.
The Salford Corporation Gas-Works.
" Rochdale Corporation Gas-Works.
" Liverpool United Gas-Works.
" Birkenhead Gas-Works.
" Birmingham Gas-Works.
" Nottingham Gas-Works.
" Newcastle-on-Tyne Gas-Works.
The Carmarthen Gas-Works.
" Merthyr Tydfil Gas-Works.
" Ystrad Gas-Works.
" St. Alban's Gas-Works.
" Over Darwen Gas-Works.
" Aylesbury Gas-Works.
" Cardiff Gas-Works.

The Morton's Lid is made circular in form, that being the most convenient and suitable shape. It can be used for Retorts of any section, by adapting the Mouthpiece casting from the D, oval, or other shape, at the back, to circular in front.

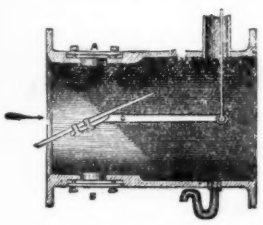
The following important Testimonial, among others, has been given:—

"*The Gaslight and Coke Company. Engineer's Office*, 6, *Westminster Chambers, Nov.* 14, 1871.

"Dear Sir,—In reply to your inquiry, I have the pleasure of stating that the whole of the Mouthpieces at Beckton have Morton's Lids attached to them and they have given us every satisfaction. We have 2160 in use.—I remain, yours truly, (Signed) "F. J. Evans."

SOLE MAKERS OF

HUNT'S PATENT EQUILIBRIUM GAS GOVERNOR.



In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown at C on the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

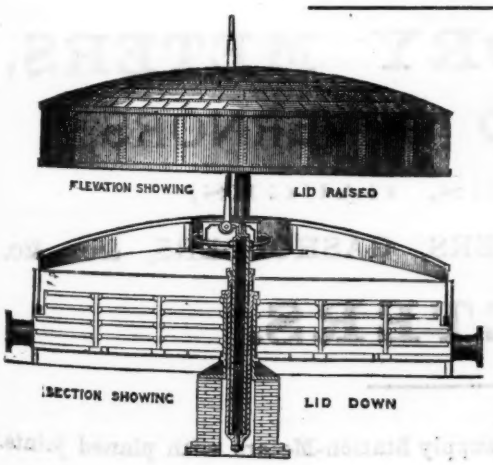
The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by several leading Gas Companies, among whom are the following:—

The Gaslight Company—a 24 in. at Whitechapel District Station.
" " a 36 in. at Goswell Road Station.
" " a 24 in. at " "
" " a 24 in. at the Gas-Works, Beckton.
The Gaslight Company—a 6 in. at the Gas-Works, Beckton.
The London Gas Company—an 18 in. at the Gas-Works, Nine Elms.
" " an 8 in. at " "
" " a 24 in. at " "

Also at the Gas-Works, Rochdale, Monmouth, Devonport, Cannes, and Mentone (France), &c.



PATENT SELF-CONTAINED

DIRECT HYDRAULIC LIFT

FOR PURIFIER LIDS

REQUIRES NO TRAVELLERS, CRANES, CHAINS, OR OTHER GEAR.

SAFE, SIMPLE, AND DURABLE.

ANY SIZE LID MAY BE RAISED BY ONE MAN

Eight Hydraulic Lifts have been applied at Beckton Gas-Works to raise the Covers of the large Check Purifiers, which are 40 feet diameter, during the past three years, with perfect success.

London 1851. New York, 1853. Paris, 1855. London, 1862.

Dublin, 1865.

The SIX MEDALS AWARDED to THOMAS GLOVER for

PATENT DRY GAS-METERS,

The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

Paris, 1867.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

THOMAS GLOVER & CO.'S PATENT DRY GAS-METERS,

1st, Are a remedy for all the defects of Wet Meters;
2nd, Are suitable for all climates, whether hot or cold;
3rd, Incur no loss of Gas by evaporation;
4th, Cannot become fixed by frost, however severe;
5th, Are the most accurate and unvarying measurers of Gas;
6th, Prevent jumping or unexpected extinction of the Lights;
7th, May be fixed either above or below the level of the Lights;
8th, Cannot be tampered with, without visibly damaging the outer case;
9th, Will last much longer than Wet Meters;
10th, Will not cost more than one-half for repair that Wet or Water Meters do;
Are upheld for five years without charge.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF

PATENT WET & DRY METERS,

STATION-METERS AND GOVERNORS,

PRESSURE REGISTERS, GAUGES,

EXPERIMENTAL METERS, PHOTOMETERS, GASHOLDERS, &c., &c.

WATER METERS.

W. P. & Co. beg to state that they are now prepared to supply Station-Meters with planed joints.

CONTENTS.

	Page
Circular to Gas Companies:—	
The Memorandum of the Commissioners for the Revision of Price, &c., in the Case of the Chartered Company	505
The Half-Yearly Meetings of the Metropolitan Companies	506
Local Boards and Gas Undertakings	506
The Liverpool United Gas Company	506
Cremation	506
The Gas Accounts of the Corporation of Bradford	506
Leading Articles:—	
Water and Sanitary Notes	506
A Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas	507
Communicated Article:—	
Leakage of Gas-Retorts and Mains. By D. A. Graham	508
Correspondence:—	
Purification of Gas	509
A "New Artificial Light"	509
Leakage	510
"London" Argands v. Silber Burners	510
West of Scotland Gas Managers Association—A Correction	511
Miscellaneous News:—	
West of Scotland Association of Gas Managers	511
Meeting of the Phœnix Gas Company	513
Meeting of the South Metropolitan Gas Company	514
Sandwich Gas Company	515
Meeting of the London Gas Company	516
Cadiz Water-Works Company	517
Meeting of the Surrey Consumers Gas Company	518
Meeting of the Odessa Water-Works Company	519
City of London Gas Act, 1868—Board of Trade Commission—Memorandum and Award	520
Glasgow New Gas-Works	523
The Northern Coal Trade	523
Institution of Civil Engineers	524
Buenos Agres Public Lighting	524
Pelouse and Audouin Condenser	524
East London Water-Works Company	524

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

We are reluctantly compelled to omit several papers of interest, which will, however, appear next week. The report of the Commercial Gas Company's meeting, and some other reports, also stand over for want of space.

THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, APRIL 14, 1874.

Circular to Gas Companies.

The memorandum of the commissioners appointed by the Board of Trade to revise the illuminating power and price of gas for the Chartered Company is of so much interest, not to that company merely, but to the whole gas world, that we make no apology for printing it at length, and commenting on the principal points. In printing, at the outset, the rules laid down in the City of London Gas Act, 1868, for fixing power and price, the commissioners set forth the obligations of the Act, which compel them to give a price calculated, in their opinion, to yield the company maximum dividends. This point is open to no dispute. There is, in our opinion, a little inconsistency in the legislation respecting the insurance-fund; but, as no notice was taken of this by the opponents of the company, we need not dwell upon it here.

The commissioners proceed to notice the results to the company of last year's revision. The actual sum required for interest and dividend on capital slightly exceeded the estimate of the commissioners; but, nevertheless, the prices granted enabled the company to pay full dividends. They paid, also, the annual charge of £5000 for the defalcation account, and £5024, the cost of the stokers strike, both of which charges were disallowed by the commissioners when calculating the probable expenses of the company for the year. There was left the magnificent balance of £209, and nothing was carried to the insurance-fund. The commissioners go on to review the present condition of the company, and, first, as regards loan capital. At the 31st of December, 1873, the sums borrowed by the company amounted, in the aggregate, to £613,500. In January of this year, the company endeavoured to borrow a further sum of £200,000 at 4½ per cent., and, at the date of this inquiry, had succeeded in raising £167,070. It was contended by the opponents of the company that, in estimating the charges on loan capital, this sum ought to be disregarded, inasmuch as it was not capital existing on Dec. 31, 1873. The commissioners, however, state the opinion that they are bound to allow for interest on all capital in existence at the date of their certificate. They add that it is manifestly to the advantage of the consumer that the company should borrow on debenture at 4½ per cent., rather than issue further capital at 10 per cent. The borrowing power of the Chartered Company in respect of their present capital is exhausted; and the power to raise the £200,000 comes to them by the arrangement made for amalgamation with the Western Company. This was an unincorporated company, with unlimited borrowing powers; but in the scheme for the amalgamation sanctioned by the Privy Council the unexhausted borrowing power of the company was fixed at £200,000. This sum, therefore, the Chartered Company had the power to raise, and the exercise of the power, as the commissioners point out, has conferred an exceptional benefit on the consumer. The shareholders of the company who have contributed the money would have greatly preferred a further issue of capital at 10 per cent., but the directors have exercised a wise and sound discretion in availing themselves of the borrowing power transferred from the Western Company.

Fortified by the opinion of the law officers of the Crown, the commissioners have again refused to entertain any questions respecting the mode in which capital was raised or expended anterior to this year. They take the paid-up capital as certified by the official auditor, and assume that it has all been expended. The paid-up capital of the company, on the 31st of December last, was £3,149,804; and therefore the insurance-fund of 1 per cent. should be £31,150. This sum the commissioners accordingly allow for in fixing the price of gas; but they have refused, as beyond their power, to compel the allocation of the amount for the particular object. Last year, the sum allowed for the insurance-fund was £29,024; but, inasmuch as the commissioners estimate of the sum required for dividend fell short of the mark by £11,189, and the price they gave was calculated to leave a deficiency of net income of £4018; and, further, as the directors paid, as they had full right to do, the £5000 to the defalcation-fund and £5024, the cost of the stokers strike, there was nothing left to carry to the insurance-fund. It has, therefore, become a charge on this year; and, although we cannot expect that the excess of profits will amount to the sum allowed for, we may reasonably anticipate that a fair balance will be carried to the fund. The only charge not allowed for this year is the £5000 for the defalcation-fund, which, of course, the directors will appropriate as before. Supposing, then, the estimates of the commissioners to be again tolerably accurate, there may this year be £20,000 for the insurance-fund.

The district of the Chartered Company is, for the most part, a settled district. The only portion in which any considerable increase in the consumption of gas is to be anticipated is in the western part. Last year the company estimated the probable increase at 7 per cent., and the commissioners accepted their estimate. As it turned out, however, the actual increase in consumption in 1873 over 1872 was only 4·9 per cent., and, strange to say, only 2·7 per cent. above the consumption in 1871; the sale of gas in 1872 having fallen short of that in 1871 by 1·9 per cent. The commissioners are, therefore, puzzled in making an estimate of the probable increase this year. They think with reason that the rise in price may check consumption, and, taking all things together, they assume, as in the case of the Imperial Company, an increase of only 2½ per cent., which is something over the increase estimated by the company.

When speaking of income derived from coke, the commissioners express an opinion that the company have made judicious contracts for the sale of this residual. They admit, too, the difficulty of forming an estimate of what coke may produce in the course of the year, and accept at once the company's estimate. It is suggested that in the half-yearly accounts the receipts for coke should be shown in gross, and the expenses of delivery stated and deducted.

As regards the coal contracts, a little blame is thrown on the directors for contracting for too much. It is easy to be wise after the event. Coal has fallen to a small extent, and may fall still further. But if any man had said last year that coals would fall to their present price, he would only have given expression to a guess, and large commercial operations cannot be conducted on guesses. Time will show how far the directors were in error in making long contracts; but under no circumstances can blame be attached to them for making certain of a supply. The coal market is still in a very unsettled state, and contract prices rule high. Whatever may be said on some other points of management, gas companies have certainly no interest in paying a higher price than they are absolutely compelled for coal, and we think directors may always be safely left to exercise their judgment in this particular. One paragraph in the memorandum seems to intimate an opinion of the commissioners that the company might buy coal and sell coke to better advantage, and in particular they suggest that systematic information should be obtained respecting the state and prospects of the coal market. Commercial men know very well the value "of systematic information," which as often misleads as directs aright.

The expenditure on purification is so small an item in gas company's accounts that it was really scarcely worth noticing, but the commissioners have taken something off the company's estimate, and they suggest that, in the half-yearly accounts, the

cost of the labour engaged in purification should be stated, as well as the cost of material. The only other part of the memorandum which requires notice is that relating to "unaccounted-" for gas." It appears that the amount of gas consumed on the works of the company, during the half year ending the 31st of December, was 26,177,000 cubic feet, which is equal to 111 cubic feet per ton of coal carbonized, and is 1·2 per cent. on the gas made. The company are recommended to reduce this consumption as far as possible. How much is consumed at the testing-stations has not been ascertained. It is probably less than the commissioners imagine, although the stations would seem to have been specially arranged to cause the largest possible consumption. A large source of loss is, with justice, pointed out by the commissioners, but will not be believed in. It is very well known, to all concerned with gas-works, that the public lamps consume a great deal more gas than is contracted for; but the vestries will not credit it. It is, nevertheless, a fact. We must hasten through the remaining part of the memorandum. The commissioners believe that the company may get more gas out of a ton of coal, apparently without reference to the quality of the coal; and they recommend the disposal of superfluous works and lands, whenever a favourable opportunity presents itself. The prices granted we have given before, and we may conclude now by quoting at length the concluding paragraph, which we commend to the notice of those who assert that the value of coke will always compensate for any increase in the cost of coal:—

> The great increase of price of gas which we find ourselves compelled to allow, notwithstanding that the price of coal has fallen, and appears likely to continue to fall, is mainly attributable (apart from the question of capital) to two facts: (First) a gas company, in order to secure themselves from possible failure in supply of coal for their manufacture, are obliged to make contracts a long time forward for delivery of the requisite supply, and therefore are not in a position to obtain more than a partial and deferred benefit from a fall in the price of coal; (Secondly) when the price of coal falls, the price of coke (as a competing kind of fuel) also falls; and as a gas company dispose of their coke, to a considerable extent, by sale in small quantities for ready money, a fall in the price of coke affects them in full and immediately, in proportion to the extent of their sales of coke in that mode.

It will be seen, by the reports of the several half-yearly meetings we publish to-day, that only one of the metropolitan companies is able to pay full dividends from the profits of the past half year. Most have to make some draw on the reserve-fund or unappropriated balance—the South Metropolitan Company to the extent of £6629, the Phœnix to the amount of £5717, the Commercial £4319, and the Surrey Consumers £3200. The Sheffield United Company have to take £2345 from their reserve-fund. The losses of the current half year will probably be greater than of any since the rise in the price of coal commenced. To the companies, coals are now at their highest, and coke is of little value—is scarcely saleable, in fact. The report of the South Metropolitan states that the cost of coal carbonized during the past year exceeded by £19,000 that of the corresponding half of 1872, while the increased receipts from products amounted to only £10,800. As remarked above, the disproportion will probably be greater in the current half year.

The Paddington Vestry seem to find but lukewarm support from other Local Boards in the agitation they have begun, to bring about the purchase of the gas companies by the Metropolitan Board of Works, and from some the proposition encounters direct opposition. The Fulham Board of Works, for example, are frightened by the probable cost of the transfer, and are scared by the possibility of a chance that, as soon as £20,000,000 have been paid for the undertakings, a substitute for gas may be found. The chance, in our belief, is a very remote one, but the risk which is shirked by the Fulham Board of Works is one that all people who invest in gas undertakings must run. The purchase of the companies being a distant, if not impossible, transaction, there is an influential party in the Board of Works who are anxious to promote competing undertakings in the metropolis. Such an enterprise would be surrounded with difficulties from the very beginning, and we can hardly believe that the idea is seriously entertained.

The Liverpool United Gas Company have given notice of an advance in the price of gas in some of the out-districts, and there is the usual uproar in consequence. West Derby strongly protests, and sends a deputation to remonstrate with the company, who will, no doubt, give very satisfactory reasons for placing this township on a different footing to Bootle.

The eccentric old gentleman who years ago desired that his corpse should be "carbonized," or "cremated," by the Imperial Gas Company, finds many would-be imitators to-day. A not very sensible article, by Sir Henry Thompson, has caused a number of silly people to make a rush, we might almost say, for gas-retorts. It may be as well to disabuse them at once. "Cremated" they may be if they like, but gas companies will not have them. Let the gentlemen of the Board of Works, who propose rival gas undertakings, look to the matter. Here is an abundance of raw material liable to no fluctuation in price, and beyond the influence of grasping coalowners and extortionate colliers. The only difficulty we foresee is the accumulation of "stock" during an epidemic. For this, however, we will suggest a remedy when the time comes.

The accounts of the Bradford Corporation show that the profits of their gas undertaking for the year ending Dec. 31, 1873, amounted to £4808, and that the total profits realized since the undertaking passed to the Corporation is £15,126. Of this sum we see that £7646 has been carried to the credit of the borough fund, and expended on such things as wood pavement. It may be impertinent to ask whether the accounts of the Corporation might not be kept and presented in a better form, but we are obliged to confess that, as they stand in this volume, they are to us utterly unintelligible.

WATER AND SANITARY NOTES.

Cholera is at Rotterdam, and, seeing the constant communication between that city and our own ports—Hull, Harwich, and London—it will be strange if some cases are not introduced into this country. We mention the subject here to put water companies on their guard. The last outbreak of cholera in London was made the occasion of a most disgraceful attack on the East London Water Company; and if, by circumstances of which we have no knowledge, and over which we can exercise no control, another outbreak should be mainly confined to the district of one water company, that company is certain to be blamed as the cause. Under such circumstances, it is advisable to exercise the utmost vigilance. Wherever the outbreak commences, the water company will be pounced upon; and, should a weak point be discovered, that, whatever it may be, will be held to be the efficient cause of the spread of cholera.

The drought has continued almost up to the time of our going to press, and the register at Greenwich shows that the rainfall of the year is less than it has been for 58 years. It is not quite so bad in the North, but on all sides we read of a steady decrease in the quantity of water in reservoirs dependent on rainfall for their supply, which may have serious consequences in the summer or autumn.

A piece of sharp practice is attempted by the Soothill Local Board, at the expense of the Halifax Corporation. It seems that, in accordance with agreements made with Captain Saville, the Corporation of Halifax are bound to supply Soothill with a quantity of water at the rate of 6d. per 1000 gallons. Soothill, it would appear, does not want all the water they may take, so they have made arrangements to supply the Horbury Local Board at the rate of 11d. per 1000 gallons, and propose to pocket the whole of the 5d. difference. The Corporation of Halifax are naturally indignant, and they intend to oppose a Bill promoted by the Horbury Local Board, which would make the agreement binding. The question is a novel one, but we cannot help thinking that the Town Council of Halifax are in the right. Soothill might at least divide the 5d. profit with the Corporation.

An inhabitant of Liverpool is trying to frighten his fellow-citizens with the prospect of a sudden disappearance of the water from the Rivington reservoirs. Coal mines are being worked under the reservoirs, and the possibility is hinted at that, on some unlucky day, the water may be tapped, and the reservoirs emptied into a mine in the course of a few minutes. The danger is remote enough; but the mere suggestion of it may be sufficient to heighten the anxiety of the people of Liverpool to obtain a new source of supply.

At Westerham, in Kent, is, as in many other country villages, a sheet of water (there known as the Long Pond), which, under what we may call normal circumstances, is merely a collection of surface drainage. The peculiarity at Westerham is that this pond has been made the receptacle for the drainage of 31 houses near by. Since, as we presume, the only escape for the water is by means of evaporation, it follows that the contents of the pond must in time become so much concentrated sewage. A brewer close by, who also uses the pond as a receiver for the washings of his casks and other brewery refuse, has a decided objection to what must be practically an open cesspool under his nose, and has invoked the aid of the Local Government Board in suppressing the nuisance. The inhabitants generally refuse to believe that the pond is a source of danger to the population, and the medical men of the place swear and declare that Westerham is one of the healthiest places in the world—only too healthy, in fact. The inquiry before Major Tulloch is not yet concluded, and we must not anticipate his decision; but we must express an opinion that brewery washings, which we know will become offensive, should be kept out of the pond as well as house drainage.

As we announced last week, the local authorities at Wakefield agreed to support the old water company, and now we learn that the new company have agreed to sell their scheme to the old for £5500, without making any reservation as to the early sale of the undertaking to the Corporation, which was at first stipulated

for. It is boldly said in Wakefield that the old company have no intention of carrying out the scheme embodied in their Bill. If they had any serious idea of doing so, it is quite likely that the opposition of Sheffield, Rotherham, and Doncaster would defeat them, and, therefore, it is probable that Wakefield will continue to be supplied from the Calder, polluted as it is.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

IX.

Historical Introduction.

(*Continued.*)

A further step towards stoking by machinery was made by Heginbotham in 1838, who proposed to pulverize the coal intended to be carbonized, and to convey it by means of a hopper into the mouth of the retort. An "apparatus composed of a central shaft passed entirely through the retort, and around this shaft was formed a worm or screw;" to which a rotary motion was given "in order to cause it to propel the coal through the retort, and keep it in constant motion, thus constituting a self-acting gas-generator, capable of feeding and discharging itself without the necessity of removing the mouthpiece of the retort." The same principle was proposed by Hompesh a few years afterwards, and since then it has been occasionally reproduced on the Patent Register.

The "Bude light," patented by Gurney about this period, excited considerable attention. This invention consisted in supplying "a jet or stream of pure oxygen to the interior of the flame of either oil, wick, or inflammable gas-lamps," and by this means the light was considerably increased. In this instance, as in all others where oxygen gas had to be resorted to, the expense attending its production prevented the adoption of any system wherein it was essential.

Following this patent was another obtained by Cruckshanks. The peculiarity and novelty of this invention consisted in rendering platinum incandescent by the flame of hydrogen gas, and obtaining light therefrom. This was effected "by placing a cage or cone of fine platinum wire over the flame, so as to enclose it, and to touch the outer surface of the flame;" by this means the platinum wire became incandescent and yielded light.

Several years after this, the same idea was patented by Gillard, who put it into practice at Narbonne, and one or two other small towns in France, but after giving it a fair trial, during three or four years, it was abandoned.

Amongst the events of this period—viz., 1840—was the invention of purifying gas from sulphuretted hydrogen, by causing it to pass through oxide of iron, for which a patent was obtained by Mr. Croll in 1840, who also proposed to revive the foul oxide by "heating it red-hot in an oven, and stirring and roasting it for some hours."

The motive-power meter patented this year by Lowe was an instrument that has never been properly appreciated, although by its use all premises where want of pressure exists could be well supplied, even supposing no pressure to exist in the mains containing the gas. A part of the patent in question refers to enriching coal gas "with naphtha or other hydro-carbonaceous liquid, so as to increase the illuminating power of the gas." For this purpose he employed "sponge or other suitable material," which, being saturated with the liquid, the gas in passing became impregnated with it. This discovery was considered of such importance that the patent was acquired by the Chartered Company, and the system was tried on a large scale at the Millbank Penitentiary, but was not successful. The principal objection to the process was the great irregularity in the evaporation of the hydrocarbon, so that at one period the gas was highly carburetted, and at another it was hardly affected by the hydrocarbon, an objection that has proved fatal to all the schemes of carburetting air.

The invention of the exhauster, for preventing the accumulation of carbon on the interior of retorts, is due to Mr. John Grafton, who, in 1841, was a director of the Cambridge Gas Company, in the affairs of which he took great interest. During his operations at those works, he suspected that the cause of the deposit of carbon—so highly prejudicial, on account of the premature destruction of the retorts, the loss of space for carbonizing, the extra fuel, &c.—arose from the pressure on the interior of the retorts, when he entered into a series of experiments, which fully justified his suspicions.

In carrying out these experiments, he first submitted the charges to a very considerable pressure, when he ascertained that the retorts were speedily encrusted with carbon; but afterwards, on operating as before, but withdrawing the pressure by means of an exhauster, he found the deposit was inappreciable. He then patented his invention, which, at first, consisted of three gasholders, but he afterwards employed an instrument very similar to Malam's first meter. At the period of this discovery, and for many years afterwards, iron retorts were universally used in England; and these, owing to the high heat, and more particularly to the heavy pressure to which their contents were subjected, were often literally half filled with carbon. This carbon commenced to accumulate at the closed end, and, in the course of time, gradually progressed towards the mouthpiece, so that a retort which, when new, was capable of carbonizing 1½ cwt. of coal at each charge, would often, after having been in use some time, not admit of more than one-third of that quantity. For some years, however, engineers failed to appreciate the invention of the exhauster, and it was not until about 1854, when clay retorts came into use, that this instrument was generally applied, and then more with the intention of preventing the escape of gas through the imaginary pores of the clay, than to avoid the accumulation of carbon in the retort. Had exhausters been employed when first introduced by Grafton, the saving to gas companies would have been enormous; on the other hand, perhaps, the value of clay retorts would not have been appreciated to the present time.

The first employment of clay retorts in England, on an extensive scale was at the Brick Lane station of the Chartered Company, in 1844, under the direction of Mr. Croll, who, about that time, obtained a patent for combining clay with iron retorts, in order that the waste heat from the former should pass to heat the latter, the two kinds of retorts being set in separate beds, heated by one fire.

The retorts employed by him were obtained from one of the most accredited manufacturers in England; nevertheless, in consequence of their defective nature on one occasion, the great experiment resulted in failure. And to this circumstance is due the prejudice which existed in England for some years afterwards against the use of clay retorts. About the year 1851, a long correspondence, extending over several months, took place in the columns of the Journal of Gas Lighting, between two eminent engineers, on the comparative merits of iron and clay retorts, each kind having its advocate, who, of course, condemned the retort supported by his opponent. This lengthy discussion induced some engineers to make a trial of clay retorts, and as by that time they were much improved in manufacture, the result was so satisfactory that, in the course of three or four years, the change from iron to clay became general throughout England.

In 1844 we find a patent was obtained by Joseph Cowen, of Newcastle, for improvements in the manufacture of "retorts for generating gas for illumination." The object of this invention was, "in the first place, to make clay retorts which shall be better able to withstand changes of temperature, and, consequently, less liable to crack." "To effect this," he says, in his specification, "mix with Newcastle or Stourbridge fire-clay, or any other suitable clay for the purpose, sawdust, pulverized wood, charcoal, coke, carbon obtained from the interior of retorts, and other carbonaceous matter, in such proportions as the quality of the clay may require." Retorts made according to this patent possessed the advantage of not cracking; but in some instances they became porous, on account of the carbon which entered into their composition being destroyed, thus passing from one evil to another. There is, however, every reason to believe that this patent led the way to the present mode of making retorts.

In 1845 gas lighting was introduced into Spain by the Messrs. Manby, sons of one of the founders of the "Compagnie Anglaise," at Paris, who formed a local company for supplying Madrid. Following this example, gas-works were subsequently erected in the principal towns of that country, nearly all of which were carried out by native capital. About this time, also, gas-works were erected in Africa, Algiers being the first town there lighted by gas.

This year another undertaking was founded to supply the western part of the metropolis, called the Western Gas Company. The works were constructed by Mr. Palmer, formerly engineer of the Equitable Company, and who had been for many years connected with gas lighting. Whether from necessity or choice is not evident, but the buildings, comprising retort-house, coal-store, purifying-sheds, &c., were all combined in an edifice having twelve equal sides; directly in the centre of this were placed the purifiers, the station-meter and other apparatus adjoining. The retort-beds, in sets of three single retorts, as then universally the practice, abutted against the outer wall of the edifice, and thus a serious error was committed by the retorts being separated the one from the other, instead of being kept together, so as to concentrate the heat, and prevent radiation.

This company, at their commencement, were by no means successful. Being in competition with the Imperial, they met with the strongest opposition from that company; while from the position of their works—adjoining a wealthy and aristocratic neighbourhood—they were subjected to continuous legal proceedings, for real or imaginary nuisances. In some instances, after permission had been obtained, and the company's mains laid to supply a district, they had to be taken up again; and such was the precarious position of the undertaking, that, in 1851, a large amount of capital was issued in £20 shares, at a discount of 50 per cent. With this fresh capital the works were reconstructed; a change of management improved their operations, their rental rapidly increased, and, in 1853, they began to pay dividends, from which time their career was completely prosperous.

Amongst the incidents of this epoch, the patent of Du Buisson merits particular attention, on account of the intimate knowledge he possessed on the subject of which he treated. His patent was for "New and improved methods for the distillation of bituminous schists, and other bituminous substances, as well as for the purification, rectification, and preparation, necessary for the employment of the products obtained by such distillation for useful purposes." In his specification the patentee describes the process of distilling schist or other bituminous rocks, and obtaining oils therefrom, the means of purifying these oils, and dividing them into three classes of different specific gravities, one of them being suitable for burning in lamps with a double current of air; he further mentions that paraffin is obtained in large quantities, from which "excellent candles" may be made; and in describing the means of rectifying the raw oil, says: "It should be agitated with sulphuric acid, which will facilitate the deposit of tar, the supernatant oil is then to be washed with diluted caustic soda, and afterwards to be distilled."

The extraordinary similarity between this, and another most important and valuable patent obtained some years afterwards, is

another illustration of the fact, that the same ideas identically may occur to two minds, quite independent of each other; and from the results we are taught also the lesson that the most intimate knowledge of a subject is of no avail, without practical application. Du Buisson derived no advantage from his patent, whilst his successor, by application and energy, made an immense fortune.

In 1847, Mansfield obtained a patent for "An improvement in the manufacture and purification of spirituous substances and oils, &c." The invention consists, first, "in the manufacture from bituminous matters, by acting on them at suitable temperatures, of spirituous substances, which are so volatile that a current of atmospheric air (at ordinary temperature) passed through them may, when ignited, continue to burn with a luminous flame till all, or nearly all, such substances are consumed." The patentee, in his specification, describes with much precision the process of manufacturing hydrocarbons, and their various properties; and applied a nomenclature which, in part, has since been retained. He further mentions "the application of hydrocarbons and of volatile spirituous substances to the purposes of artificial light—firstly, by mixture, in the manner before described, of a current of atmospheric air, or of other non-inflammable gases, with the vapour of spirituous substances, which are so volatile and of such a nature that a current of air or gases of the ordinary temperature, or slightly heated, having been passed through a reservoir containing the spirituous substances, may burn with a luminous flame at a distance from the reservoir, without the application of heat."

Although Donovan, in 1830, had applied the vapours of hydrocarbons for enriching gases, and Lowe patented the same system some years afterwards, yet in Mansfield's patent we find the first record of the means of employing atmospheric air as a medium for conveying the vapour of hydrocarbons to the burners, where it was ignited to produce light. Subsequently, the same system became the subject of several patents, and in 1862 Mongreul presented it under the name of "Photogenic gas," and a company was formed for carrying out the "invention." This enterprise was inaugurated with a capital of £40,000, one-half of which was devoted to compensate the fortunate patentee, and the balance was simply exhausted on useless trials, without carrying the scheme into practical use. Three years after the first establishment of the Photogenic Gas Company, it was wound up, and, as the sequel has proved, without giving that lesson to a credulous public which might have been expected.

From that period numerous other patents have been obtained, and companies have been formed; and, at the present moment, several schemes are before the public, all for carrying out the means of producing light by a process identical with that patented by Mansfield; and, whether under the name of "photogene," "air gas," or any other term, in all these processes there is not the slightest originality to sustain the claims of the patentees. Yet, such is the ignorance of a certain class of individuals, that, at the present time, a month seldom passes without the patent list containing "a means of carburetting air," or something analogous.

(*To be continued.*)

Communicated Article.

LEAKAGE OF GAS-RETORTS AND MAINS.

By D. A. Graham, Stalybridge.

You recently published an article of mine, in which I endeavoured to deal with the principles that should regulate the valuation of coal. The following contribution is an endeavour to examine into the principles of valuation of the leakage of retorts and mains, its purpose being mainly to show what amount of leakage in retorts is sufficient to justify their being repaired or renewed, as also to show the actual loss entailed in the leakage of street-mains. Several of the values here assigned will only be a repetition of some of those already quoted.

The gas was valued at 3s. 3d. at the station-meter, and if the leakage were 15 per cent., the 3s. 3d. would only represent 85 per cent. of the price at which it was, on the average, sold to the consumer, so that the average price the public would pay would be—

$$\frac{3s.\ 3d. \times 100}{85} = 3s.\ 10d.\ \text{nearly.}$$

But in estimating the value of the leakage of retorts, it will be better, as before, to estimate the value of the gas as returned at the station-meter—namely, 3s. 3d. This method of valuation enables comparisons to be instituted between the returns per ton and the per centage of leakage; which will be found to be more convenient than if the price charged to the consumer were substituted.

A setting of retorts, such as those generally used in Lancashire districts, will, on the average, carbonize 800 tons of coal per annum, although, in some districts, 666 will more nearly represent the annual amount of coal they carbonize; these latter, carbonizing 4 tons 4 cwt. per 24 hours, generally being built on the principle of Cliff's ovens, while settings of retorts, capable of carbonizing 1 ton a day for each through and through length, with five retorts to a setting, will, on the average, carbonize 800 tons per annum.

$$\frac{666 \times 5\ \text{tons}}{4{\cdot}2\ \text{tons}} = 800\ \text{nearly.}$$

And the quantity of gas each setting will annually produce, the coal and cannel mixture being estimated to produce 9500 cubic feet per ton, will be—

$$800 \times 9500 = 7{,}600{,}000,$$

which, valued at 3s. 3d. at the station-meter, would be worth—

$$3{\cdot}25 \times 7{\cdot}600 = £1235.$$

A setting of five retorts (*throughs*) will cost for renewals—not including the rebuilding of arches—a sum not exceeding the following estimate:—

100 feet retorts, at 6s. per foot run	£30	0	0
4000 bricks, at £4 per 1000	16	0	0
Fire-clay, say	4	0	0
Wages for bricklayer	14	0	0
Fixing mouthpieces and ascension-pipes, &c.	6	0	0
	£70	0	0

And if repaired for one year after working a season, at, say, an extreme cost of £20, the cost of repairs and renewals every second season would average—

$$\frac{70 + 20}{2} = £45\ \text{per setting of five retorts.}$$

Comparing the cost of renewals (£70), repairs (£20), and the average cost of renewals and repairs (£45), with the average amount of gas each setting makes per annum, will show the relative per centages of loss of gas, which, if saved, would repay for these several outlays, the gas being valued at 3s. 3d. per 1000 cubic feet.

						Average of Gas Manufactured.
Renewals at £70	£1235	:	£70	:: 100	:	5·66 per cent.
Repairs at £20	£1235	:	£20	:: 100	:	1·62 „
Average of repairs & renewals at £45	£1235	:	£45	:: 100	:	3·64 „

But the loss sustained by the leakage of gas through defective retorts is only one item in the estimation of the waste of labour and capital, and it will be found that considerably less per centages of loss than those above specified would repay for the renewal or repair of retort settings; for, in the carbonizing of a ton of coal whose products are leaked, not only is the value of the gas which passes up the chimney lost, but the 2s. 5d. for wages; the interest on the settings, at, say, 1s. per ton; the value of the tar and ammonia which pass out of the leak, at 4s. 4d. per 10,000, or, in the working of a 9500 coal, equal to 4s. 1½d. $\left(\frac{52d. \times 9{\cdot}5}{10}\right) = 4s.\ 1\tfrac{1}{2}d.$; the 33 per cent. of the weight of coal carbonized used as fuel, at, say, 10s. per ton, or 3s. 4d. in the ton; the price of the coal, at, say, 20s. per ton;* and out of all this unnecessary expenditure, only 3s. 4d. is returned in the shape of receipts for the 33 per cent. of the weight of coal carbonized—namely, the surplus quantity of coke not required for fuel. Proceeding now to add these values, and deducting the 3s. 4d. for coke, I find that in the leakage of the products of a ton of coal the following loss is sustained—for it is evident that had all these several items been sold or utilized, instead of being lost, the gas could have been cheapened to the consumer by nearly the amount of their value:—

9500 feet of gas, at 3s. 3d. per 1000	£1	10	10½
Wages, at 2s. 5d. per ton	0	2	5
Interest on settings, at 1s. per ton	0	1	0
Tar and ammonia value, at 4s. 4d. per 10,000 cubic feet	0	4	1½
Coke used as fuel, one-third of a ton, at 10s.	0	3	4
One ton of coal, at 20s.	1	0	0†
	£3	1	9
Less 3s. 4d. for excess of coke not used for fuel	0	3	4
So that the loss is represented by	£2	18	5

To find, then, the per centage of loss of gas which will repay for the various outlays before specified, it will first be necessary to ascertain the relative proportions of the value of the gas in the above estimate—namely, £1 10s. 10½d.—to the whole loss, £2 18s. 5d.

£2 18s. 5d. : £1 10s. 10½d. :: 100 per cent. : 52·7 per cent.

So that 52·7 per cent. of the various per centages of loss previously estimated will show the per centages of loss of gas which will repay for the average of renewals and alterations, and for renewals or repairs taken separately.

52·7 per cent. of { 5·66 per cent. = 2·98 per cent.
1·62 per cent. = 0·853 per cent.
3·64 per cent. = 1·918 per cent.

From the above, it appears that if a setting of retorts loses 3 per cent. of the gas a 9500 coal is capable of making—at the aforementioned values—if *they* are far gone, it will pay to reset them; and if the settings are capable of being thoroughly repaired, a loss of three-fourths of a per cent. will repay for the outlay; and if the settings were renewed every second year, the same setting being repaired the following year, a loss of 2 per cent. of gas from a 9500 coal would repay for outlays.

So that for a ton of coal producing 9500, if a setting loses 2·98 per cent., or 283 feet out of the ton, it will pay to renew it; and if 0·853 per cent., or 81 cubic feet out of the 9500, leak, it will pay to repair; and the average for repairs and renewals, 1·918, will be equal to a leakage of 182 cubic feet per ton from a coal capable of producing 9500 cubic feet.

There are retort settings of which it may be said with truth that some yield thirty, some sixty, and some an "hundred fold;" but how

* It will be evident that these valuations of leakage will vary with all these values. When the average cost of coal, coke, &c., is more than the values assigned, the values for each per cent. lost will be considerably increased, or *vice versâ*.

† This valuation does not include the charge for renewals, that *not* being equal for all sorts of settings, some requiring 4d. per ton carbonized to repair them, while others require 1s.

far it pays, in these days, to use the thirties and sixties must be left for the consideration of those who are insane enough to use them.

The foregoing estimates prove that it will generally pay companies to be even lavish in their expenditure on repairs and renewals of retort settings, and shows the secret of the success of companies who spare no pains nor expense to ensure perfectly sound and reliable workmanship in the construction and material used in their retort settings.

The other branch of this subject—namely, the valuation of the leakage of gas-mains and services—remains to be treated of in a similar manner.

Under this head some items are a source of revenue, which, in the case of retort leakage, are lost. Thus—the wages at 2s. 5d. per ton, the gas at 3s. 3d. per 1000, the price of the coal at 20s. per ton, the interest on the settings at 1s. per ton, the charge for labour and material used in purification at, say, 1d. per 1000, or 9½d. for a coal producing 9500, and the fuel used for carbonizing being 33 per cent. of 10s., or 3s. 4d., are all lost; but the tar at 4s. 4d. per 10,000, or, on a coal producing 9500 cubic feet per ton, 4s. 1½d., and the 3s. 4d. worth of surplus coke not used for fuel, but sold, these are sources of revenue.

So that, under this head, for every ton of coal used to supply leakage, the undermentioned sums will be lost, or be capable of being applied to revenue:—

9500 feet of gas, at 3s. 3d. per 1000.	£1	10	10½
Stokers wages, at 2s. 5d. per ton.	0	2	5
Interest on settings, at 1s. per ton	0	1	0
33 per cent. of coke used for fuel, at 10s. per ton	0	3	4
One ton of coal, at 20s.	1	0	0
Purifying wages and material, at 1d. per 1000 on 9500	0	0	9½
	£2	18	5
Receipts—Tar £0 4 1½			
Coke 0 3 4			
Less	0	7	5½
Showing a loss of	£2	10	11½

on each ton of coal which goes to supply street leakage.

For an average-sized company, using, say, 16,000 tons of coal and cannel per annum, 15 per cent. leakage in street-mains would represent a loss of the use of 2400 tons of coal and cannel:—

$$\frac{16{,}000 \times 15}{100} = 2400;$$

which, taken at the value of loss above assigned, would be equal to a loss of £6115.

£2 10 11½ × 2400 = £6115 0 0

$$\text{And } \frac{£6115}{15 \text{ per cent.}} = £407\ 13\text{s. } 4\text{d. on each per cent. lost.}$$

16,000 tons × 9500 cubic feet = 152,000,000 at station-meter,
Less 15 per cent. leakage = 22,800,000

Leaving . . . . 129,200,000 to sell;

$$\text{And } \frac{£6115}{129{,}200} = 11{\cdot}3 = \text{a charge of } 11\tfrac{1}{4}\text{d. per 1000 lost, on each 1000 sold.}$$

If 10 per cent. be taken to represent what might be termed a fair and reasonable amount of leakage, then one-third of £6115, or £2038 6s. 8d., would represent the loss such a company would sustain through street leakage over and above what might be considered reasonable and unavoidable, which sum, capitalized at 10 per cent., would represent a capital of £20,380, and at 5 per cent. a capital of £40,760; the latter sum probably representing, in the case assumed, the entire value of the mains and services, which £2038, if annually applied to renew and enlarge services and mains, enabling low street pressures of, say, not more than 2 inches, to be wrought, would soon become a source of profit, or be capable of being applied to enrich the quality of the gas, or to reduce its price by nearly 4d. per 1000.

$$\frac{11{\cdot}3}{3} = 3{\cdot}7 = 3\tfrac{3}{4}\text{d.}$$

Under this head—"Leakage"—"unaccounted-for gas" (other than that used by a company) is also generally included; although, were compensating meters used, this item would probably disappear, if, indeed, the registration would not more probably be 2½ per cent. in favour of gas companies. But it is to be feared that, in manufacturing districts, where two-thirds of the consumption goes to supply manufactories, which generally use meters which are not provided with floats, nor any compensating arrangement, and where the regularity of the water-line depends upon the supervision of inspectors, the fault will lie on the other side; in which case, supposing the companies charges are equitable, the consumers who pay for just quantities, or for more than has really passed and been registered by their meter, pay for the deficiencies of such a consumer.

Were such deficiencies general through a district—say to the extent of 5 per cent. on every 1000 registered at the consumers meter—it will be evident that the public would be paying less for their gas than they seemed to do, by the difference of the proportion of the amount their meters registered and the amount they really consumed. Thus, if a community paid 3s. 10d. per 1000 cubic feet, and consumed, say, 5 per cent. more, then they would only be paying 3s. 7¾d. per 1000—

$$\frac{3\text{s. } 10\text{d.} \times 100}{105} = 43{\cdot}81 = 3\text{s. } 7\tfrac{3}{4}\text{d.}$$

If the company paid their dividends and other expenses they would sustain no loss, that being borne by the consumers who were having their just measure, or by the consumers who were having less than their just measure, or by the consumers in general; in which latter case, if proportionally laid on, no loss would be sustained by either the company or the consumer.

In the foregoing estimates the consumers are, on the average, supposed to pay 3s. 10d. for their gas at their meters, which is, of course, such a charge as compensates for all losses and expenses, and includes a charge of 10d., or 1s., or 9d., which would represent the clear dividend profit for the use of capital invested; but if part of this 3s. 10d. is employed to pay the interest on capital used in first purchasing, and then paying for the working of a coal which is purchased to be lost, or to supply a loss—as in the case of leakage—which loss of capital has annually to be restored—then it is fair (and a corporation would view it from such a stand-point) to estimate capital, and interest for use of capital, as losses, which is the view taken in these estimates, where the price charged for gas leaked includes the profit, which in this case is estimated as a loss, being interest charged for value of capital which is lost, which value has to be restored; which capital and interest are, therefore, lost, because, practically, their value is thrown away and not utilized.

Every shilling more such a company would give for coal more than it was worth would be throwing away £50 for every 1000 tons of coal thus purchased; and if they used 16,000, this shilling would amount to £800. Every 1 per cent. leaked on one setting of retorts would represent a loss of £23 9s. 9½d.:—

$$\frac{£70}{2{\cdot}98} = £23\ 9\text{s. } 9\tfrac{1}{2}\text{d.}$$

And on the foregoing supposition, that 16,000 tons would be used annually, 20 settings would be in use:—

$$\frac{1600}{800} = 20 \text{ settings.}$$

One per cent. of retort leakage would amount to a loss of 20 × £23 9s. 9½d. = £469 16s.

Finally, it will be apparent that an excellent recipe for ruining a gas company would be—Purchase what are termed cheap coals, spend as little as possible in the repairs of retorts, and do not trouble yourself about leaky mains or services.

Such a rule, if faithfully acted upon, must ensure ruin, or if dividends are paid (?), they must be paid at a cost ruinous alike to a company and the public they supply.

Correspondence.

PURIFICATION OF GAS.

SIR,—Mr. Patterson complains that my letter, indicating the heads of a paper on the purification of gas, gave meagre descriptions compared with his report on ammonia purification, from which he quotes.

I think Mr. Patterson is too hard on me here, for I did not profess, in my letter, to do more than indicate—not explain; the explanation will, I hope, be found in the paper itself.

I wish Mr. Patterson would make it convenient to attend our meetings, and take part in the discussions. I am sure we would all be glad to see him, and also to hear him; for he writes more intelligently on the purification of gas than most of us do; and it is mere matter of fact and history that it was through his improvements in the mode of working lime purifiers that the sulphur compounds in the Chartered gas were reduced from 70 to 8 or 10 grains per 100 feet.

Whether Mr. Patterson's mode of working the lime purifiers, or mine, is the better way, I would be loth to dogmatize on. He says his is the better of the two; but I would rather he accompanied the statement with chemical reasons. And this leads me to say that the difference between the two systems is so trifling, that it is very difficult for Mr. Patterson and me to get up a "good row" on the subject; our opinions seem to me to be so much alike.

Whether those said sulphur compounds are worth all the trouble they have caused London gas engineers, is a matter on which I am very much in doubt. The governor of the Imperial Company told us the other day that he had smelt the gases, and he could not find any difference.

Without confirming the propriety, or, in his case, the efficiency, of a nasal test, I am a good deal of his opinion. I am not so "down upon" sulphur as some people—I am rather an advocate for having "a little of it in the air;" but "let no dog bark." I know I am here on very "kittle" ground, and I have no time now to do more than make the statement.

If Mr. Patterson will come among us in June, he will find hands of good fellowship held out to him right and left, for I am sure we all feel that he has done good, and he may yet do more; for we have still several things to learn in gas manufacture, and I would fain have the opportunity of making his acquaintance. We want his clear head and logical mind, which seemingly never jumps over, but goes right through and removes, difficulties. GEORGE ANDERSON.

"A NEW ARTIFICIAL LIGHT."

SIR,—As Kimmeridge shale is being brought rather prominently before the public after having been allowed to rest in peace for the last 10 years, some details respecting it may prove interesting to your numerous subscribers. Ten years since I was a witness in the famous patent case, *Young v. Fernie*, and for the purposes of this trial, and also in my endeavours to save something out of the fire, for the unfortunate shareholders of the Wareham Oil Company, I made a full investigation on a large scale of what could be done with the Kimmeridge coal and shale. The portion of the strata I experimented upon is that exposed on the

sea cliff, in the neighbourhood of the village of Kimmeridge, where it had also been worked by the various companies and individuals who, between 1847 and 1865, sunk a total capital of at least £50,000 in endeavouring to make this mineral commercially available. As there seen, the seams are as follows, beginning from above downwards:—

Thin shale, rock, short joint coal, short joint shale, dirt bed, then three seams of shale alternated with Portland cement rock, then a dirt bed, and, lastly, the main coal, which is about 2 feet thick, with a thin parting of rock 6 inches from the roof.

As the top coal is too thin to work, and I found the shale only contained 19 per cent. of volatile matter, and was, therefore, too poor for there to be even a chance of making it pay, I confined my attention to the main coal, and the first fact I ascertained was that it is very expensive to work. With a soft roof, and a hard floor, and itself so hard that every pound of it has to be blasted with powder, it costs very much more to win than any coal I am acquainted with. The following are the average results of its distillation at an oil temperature—that is, black to a just visible red heat—in 3 cwt. charges:—

Ammoniacal liquor	27 lbs.
Oil	47 „
Gas	52 „
Coke	210 „

The coke, with great care, and in well-constructed furnaces, may prove sufficient to heat the retorts. The ammoniacal liquor is of fair quality, I think, but have no notes as to this. The oil and gas together give a yield of 29·5 per cent., which corresponds pretty nearly with Mr. H. W. Bristow's result, of 11,300 cubic feet of 20-candle gas, equal to a yield of 20 per cent. by weight in gas only, the 9½ per cent. being a fair allowance for loss in purification and the gas tar. In estimating the value of this mineral, it must be remembered that it contains an extraordinary quantity of sulphur, so that the purification is expensive. As it yields 35 gallons of oil to the ton, it would at first appear that it might be made available for the production of illuminating and lubricating oils. Unfortunately, however, it contains a large quantity of a sulpho-hydrocarbon, which it is commercially impossible to remove for the manufacture of gas. However, it would be perfectly available, if it could be obtained at a sufficiently low price, the only requisite being that gas-works using it should increase their purifying power, using large purifiers, charged with oxide of iron, to remove the extraordinary amount of sulphuretted hydrogen present in the crude gas. The cost of the material is the only difficulty, and is, I fear, a point that Mr. Moule has overlooked. It was for some time used in the Wareham Gas-Works, and abandoned because it was not so cheap as other coals. I should add that the gas tar yields a good per centage of benzole. The above will enable those engaged in the manufacture of gas to judge, with some degree of accuracy, as to what they can afford to give per ton for this Kimmeridge coal.

I have just had my attention called to another new (?) gas, or, at any rate, a gas with a new name—the "Kalosic." As far as can be learned from the description, the heating gas is simply carbonic oxide, mixed with an enormous quantity of nitrogen and air, as is necessarily the case when this gas is produced by passing air through red-hot carbon; it is, therefore, for heating purposes, very inferior to water gas; and the way in which, in the article in the *Mining Journal* I have before me, its heating powers are proved to be about double that of coal, is certainly very simple and ingenious. The writer takes its theoretical heating power, and compares that with the absolute work done by coal, when used in raising steam in an ordinary boiler! As regards the illuminating gas—made, it is said, by combining the heating gas with hydrocarbons—no details are given; but certainly a worse gas for the purpose than a mixture of carbonic oxide, nitrogen, and oxygen cannot well be found.

EDMUND R. SOUTHBY, F.C.S.

36, *Willes Road, Kentish Town, N.W., April* 9, 1874.

LEAKAGE.

SIR,—In answer to Mr. Simpson's inquiry, my correspondent informs me that his increased leakage arises—

1. From an increased length of mains.
2. From extra pressure required to supply some factories at the end of these mains.
3. From an extra mile of mains laid to supply a few lamps only.
4. From the increasing infirmities of an old gasholder.

Mr. Simpson will at once see that the remedies for the above are larger mains and a new gasholder. The saving in leakage would amply repay the expenditure in a few years, if the town is a growing one. As to 9000 feet per ton being sold in the provinces, I can only say that the case given is not a solitary example, and that if directors would only sanction the outlay, there is no reason why such results should not be more general than they are.

I am almost afraid that the present fall in the price of coals will prevent the attention being given to the subject that its importance demands, knowing right well how hard it is to move directors when the maximum dividend is paid.

THOS. H. METHVEN.

Gas-Works, Bury St. Edmund's, April 10, 1874.

"LONDON" ARGANDS *v.* SILBER BURNERS.

SIR,—It appears that my letter to you upon the two paragraphs published in your JOURNAL dated the 24th of March last has displeased Mr. A. M. Silber, Assoc. Inst. Civil Engineers, in a remarkable degree, and occasioned him no small *surprise*. No doubt he is surprised that I should venture to question a statement made by Rear-Admiral Lord John Hay, C.B., upon the authority of a report from the Royal College of Chemistry. It never, probably, occurred to Mr. Silber's aristocratic mind that I, being only a trader, should suffer an injury did I allow that statement, supported by what I consider insufficient evidence, to go unchallenged. Of course, gentlemen operating in the *higher commercial circles* never make use of such means to facilitate their operations as would be put into requisition by traders to sell their wares.

When *they* "confer a boon on society," the leading journals are loud in their praises—post-prandial oratory sheds a halo of glory around *their* immortal names, and admiring shareholders confer upon them substantial marks of their appreciation of the inventor's ability.

I dare say, sir, you will remember the extraordinary reception given by the leading journal to Mr. Silber's brilliant scheme of illuminating London by means of petroleum laid on to private houses, like water or gas, the latter useful fluid being thus entirely to be dispensed with. It is true that the benighted municipality of London have not yet put this scheme into practice, although it was my lot to be a sorrowful witness, from the Bridge of St. Denis, of the manner in which an extremely rude adaptation of an idea somewhat resembling his was carried to its ultimate result by the people of a neighbouring capital. It is only just to state, however, that in this case the pipes were *laid* in a *very temporary* way; probably had they been more scientifically put down, the result would have been the evolution of illuminating power surprisingly superior to that which was once said to have been obtained by a peculiar mode of using the Chartered gas in Leicester Square.

In a manner to some extent similar, but equally sensational, except that the "Thunderer" has not yet spoken, another brilliant discovery of Mr. Silber's is brought before the public, and upon the authority of the meagre and extremely vague report of friendly experiments, carried out in a manner, without doubt, entirely favourable to this new creation or creations, and, as I have already pointed out, eminently unfavourable to the "London" burner, it is sought to impress the public with the notion that the "Silber" burners are much better than the "London" burners, and that the former will, burner against burner, give 20 to 25 per cent. more light than the latter. The belief which Lord John Hay expressed, that the total saving was about 50 per cent., I see, applies to the comparison between ordinary burners—I suppose this means ordinary iron fishtails and bat's-wings, which are said to give no more than 10 or 12 candles light—and the "Silber" burner.

The report is upon two kinds of burners—the Argand and the bat's-wing. It goes on to say "that the burners were subjected to the most exhaustive and rigid tests, and it follows from these experiments—First, that four cubic feet of gas give as much light as *five feet given* by the most perfect ordinary test-burners." By this latter phrase is meant, as Mr. Silber says, the gas referees test-burner, described by them as No. 1, and by myself as No. D, it being the fourth size in the series of eight. What we are to infer from this is not very clear, but I presume Silber's Argand and bat's-wings gave for 4 cubic feet of gas as much light as was given by the gas referees standard burner, No. D, with 5 feet of gas. Mr. Silber says that it is the only one Mr. Valentin would be likely to use, but Mr. Valentin does not say so in his report. Was he troubled with that delicacy about names which even highly commercial firms do no always appear to suffer from, more especially when it is necessary to show the value in illuminating power of newly invented lamps which have not yet been proved so economical and effective as gas? At least, if they do not do it themselves, they suffer it to be done by others in their interest.

I do not gather, from a careful perusal of Mr. Silber's letter, that he distinctly says so, although he leads one to that belief, that the remarks of Mr. Valentin and the noble chairman were *intended* to apply to the "London" Argand burner. (Which one?) The report further on states "that common gas is placed on a level with the more expensive cannel gas"—Is cannel gas, when consumed in a burner which will give such results as Mr. Silber's is said to give, and constructed upon those principles on which the proper combustion of gas depends, really more expensive than common gas?—"and that there will be no more necessity for the more expensive cannel coal." What is the illuminating power of the gas which is thus placed on a level with cannel gas, and how is it that burners which do so much for common gas cannot do proportionately great things for cannel gas? "A saving of 20 to 25 per cent. is placed within reach of the consumer taking the Argand as the test of comparison"—What Argand?—"but considering that the ordinary burners scarcely ever give more than 10 or 12 candle light, the saving effected is about 50 per cent." What are the ordinary burners here mentioned, and with what quality of gas by the jet photometer or referees standard burner do they give 10 or 12 candle light?

Without my letter to you, sir, and Mr. Silber's reply thereto, I think there would have been a delay of at least two months before we should have obtained even this meagre statement of the grounds on which Mr. Silber bases the superiority of his burners over the "London" burners.

I think it is only fair to say that this report seems to have been made only for Mr. Silber's proprietary, and, as such, was never intended to be subjected to rigid scrutiny. When gas-burners intended for consumers use, upon which no restrictions are placed as to the quantity of gas to be consumed, length and size of chimney, air-passages, &c., are tested against a standard burner, whether Argand or flat-flame—which, although the most perfect of standard burners, must necessarily be fettered in every way—the results obtained by different consumptions with some qualities of gas may be calculated up by simple proportion into something surprising; and, from what he says, Mr. Silber can be no stranger to this fact. Why was not four feet of gas tried against four feet? "London" Argand burners—and flat-flame burners, too—can be obtained which will burn this quantity; and gas engineers can very easily ascertain for themselves whether by this means the figures quoted by the noble chairman of the Silber light may be changed for better or worse.

It is necessary here to obsefve that I am not permitted to make any alteration or improvement in any of the standard burners. The reason is evident. As they were when adopted by the late gas referees (Argand and flat-flame), so they have been adopted by their successors, one of whom is Professor Tyndall. There is a set of three chimneys to each Argand burner, each differing from the other in size and height, and which are to be used with different qualities of gas. All these are necessitated by the exigencies of gas testing; the gas referees know very well that, such as it is, it is not the best burner I make, although it is the best which has been yet produced for testing the illuminating power of gas. It is also known to the testing officers that with the ordinary gas supplied by The Gaslight and Coke Company to the City of London, which is now sometimes equal to 19 candles, the gas referees burner, which is made suitable for 16-candle gas, does not give a good result for the gas it consumes, but as they are obliged to burn 5 cubic feet, and no less, it cannot be helped. Another size of the "London" burners would give a much better result, but the gas referees do not at present permit it to be used. So, sir, you will perceive at once that it is quite within the power of Mr. Silber, or any other person who is not bound by any such restrictions as I have mentioned, so to dispose his burner as to get almost any result he likes by testing it against the gas referees standard burner. Hence my complaint. I am perfectly ready to test my "London" Argand consumers burners, which have been much improved since the adoption of the "London" Argand test-burner by the gas referees, against Mr. Silber's or any other burner; and, since you have accepted my offer, I shall take an early opportunity of placing in your hands specimens of all the "London" burners I make for the use of consumers of gas. Several of

these. I have the strongest reasons to believe, neither Mr. Silber nor Mr. Valentin has ever seen. They, or any one else, are at liberty, with your permission, to test them against any burner of their own, providing they do so fairly, and upon all the points which constitute a really useful consumers burner, and I am confident that the result will not be disastrous to me.

I need not follow Mr. Silber over the whole of his letter. I should trespass too much on your valuable space and the patience of the gas world in general, who are quite able to appreciate the most of it at its proper value. They will, without doubt, agree with me that the error committed by a trader (not necessarily acquainted with the aristocracy, as gentlemen moving in the higher commercial circles are supposed to be), in mentioning the name of the chairman of the Silber Light Company, is not "a sign of inaccurate habits of mind in other respects." Otherwise, it does not appear that Mr. Silber himself is free from such a fault.

He says that I speak of other burner-makers as the "enemy." I do not. The "enemy" referred to is the Moderator oil-lamp, as your readers can plainly see, if they will kindly refer to page 103 of the Report of Proceedings of the British Association of Gas Managers, 1873, my words being addressed to the gas managers present: "Now, look at your enemy, the Moderator lamp." Had he read more carefully, he would not have been led to make remarks so really inaccurate, neither would he have thought it necessary to address to me some highly sentimental talk upon commercial principles, fair trading, &c., all of which, coming from him, clashes strangely with his wish that we should accept Mr. Valentin's report without any discussion for the next two months at least, during which time the Silber Light Company will enjoy the commercial benefits to be derived from such a statement. I think, on the other hand, the mode by which the "London" burner become known to the public, and the severe and numerous trials made by various high authorities before it was finally accepted by all parties, in this country as well as in many others, as the standard burner for testing gas, contrasts favourably with the way Mr. Silber brings forward his latest creation, which, he says, will depose the "London" burners, and banish them from general use. The wish is doubtless father to the thought; but if threatened men live long, the same may be true of the "London" burners in a like condition.

In conclusion, permit me to ask one question: Has Mr. Silber ever produced, by the use of one of his burners, a light equal to 22 parliamentary sperm candles from the consumption of 5 cubic feet of the Chartered 16-candle gas (not 18-candle gas), as tested by the gas referees burner?

WILLIAM SUGG.

Vincent Works, Vincent Street, Westminster, April 9, 1874.

WEST OF SCOTLAND GAS MANAGERS ASSOCIATION A CORRECTION.

SIR,—In the report of the reading of a paper by me at the meeting of the West of Scotland Gas Managers Association (with discussion thereon), which appeared in your JOURNAL of the 7th of April, there exists several slight inaccuracies. For instance, I am made to say that I am able to make 2000 feet of gas more per ton than any other man, which should have been "4000 feet more per ton than any other man." Again, I am made to say, "If not so much gas per retort was wanted, more incandescent coke was left in." This is precisely the reverse of what I did say. Again, "Mr. Malam stated that his benches cost £40 each, *iron retorts*, bricks, and labour included." What I stated was this—that my benches cost £40 each, *iron mouthpieces*, fire-clay retorts, bricks, and labour included. I also stated—but this may have been inaudible to your reporter—that the new mouthpiece could be adapted to existing works, where new benches were not required, at a cost of something like £3 per mouthpiece.

Kindly give this space in your next issue, and oblige,

Gas-Works, Dumfries, April 10, 1874. A. MALAM.

Miscellaneous News.

WEST OF SCOTLAND ASSOCIATION OF GAS MANAGERS.

(*Continued from page* 447.)

In connexion with the reading of Mr. Malam's paper—

Mr. JOHN RICHMOND (Whitburn) asked how the water entered the ascension-pipes in Mr. Malam's apparatus.

Mr. MALAM pointed out on the model a pipe parallel to the hydraulic main, from which a separate service came off for each ascension-pipe; the hydraulic main, of course, could be placed anywhere; the retorts are charged from the back end, the door near the ascension-pipe being a fixture. The troughs round the mouthpiece are kept level all through the house by a ball-cock. The gas has, in passing up the pipe, to pass through a spray.

Mr. KEY: Is not that part of retort where the incandescent coke or bricks always lie on—there being no coal charged on it, to rob it of its heat—apt to burn away very quickly?

Mr. MALAM: No and I find that the part next the fire goes first.

Mr. KEY: How often do you approve of renewing your retorts?

Mr. MALAM: I have been in the habit of replacing my retorts once a year, and approve of it.

The PRESIDENT: I also approve of doing so. By employing high heats, much more is gained than would twice cover all the expense of new retorts. They cost £3 when new. Besides, it is a bad plan to keep retorts in a shaky state, whereby the loss of gas in their working can never be recovered. In any case they should not be kept in more than two years when the ovens have good heats.

Mr. PEEBLES (Edinburgh): I had the pleasure of hearing Mr. Malam at Kirkintilloch, when he brought forward his scheme in a clear and simple manner. At that time, however, his plan was novel, and we regretted the absence of statistics. He has now improved the process, and in the paper in our hands has given us a very satisfactory statement of it. The data it contains are what we can all see and appreciate, and, to practical men, nothing could be more convincing. The quality of the gas, the appearance of the coke, and the constitution of the tar, as reported by Dr. Stevenson Macadam, all converge to one result. Since everything is taken out of the tar there must be more gas. One question only I would like to ask. Are you sure the change in colour of the liquor you refer to is really oxidation, or some decomposition similar to that of a photographic film? There might be here a discovery of interest which would redound to Mr. Malam's credit. We might see our pictures yet taken by means of these products. At any rate, I now see why Mr. Malam so generously invites us all to Dumfries. It is on account of the enormous amount of money that is there being saved.

The PRESIDENT: Perhaps Mr. Ross of the chemical works, Falkirk, could throw some light on this question of Mr. Peebles.

Mr. MALAM wished first to state that there was quite a phenomenon connected with it. The overflow of water went to the tanks of the gasholders, and in the morning the gasholders and pillars presented all the colours of the rainbow. It looked quite as if an artist had been there. It was something new. Not many had such beautifully ornamental works.

Mr. JAMES ROSS (Falkirk) said he did not know what product this was at all; tar products in a crude state got black by exposure to light. Whether it was oxidation or not, any thin film would give a play of colours, but he should like to see this.

Mr. PEEBLES: Will your greenish liquor turn black in a bottle, although not exposed to the air?

Mr. MALAM: I have not had time to test the matter, but intend to do so.

Mr. D. M. NELSON (Glasgow): Do the colours on the holders remain, or pass off?

Mr. MALAM: They disappear when the sun comes out.

The PRESIDENT then moved a hearty vote of thanks to Mr. Malam for his valuable paper and beautifully got-up models, which was accorded amid great applause.

Mr. JOHN HALL (Newmilns) read the following paper:—

ON A SIMPLE METHOD OF REPAIRING SMALL HOLES IN GASHOLDERS.

Gentlemen,—From the circumstance of my coming before you to-day to explain a simple, effective, and durable method of reparing round or elongated holes in the crown or sides of gasholders, it must not be thought that I assume there are no other or better means of accomplishing the object. I offer the following remarks with a desire to carry out one object of our association, and endeavour to elicit discussion on a subject of some practical importance as applicable to our small works.

I wish to refer to-day, only to small holes in gasholders that may have occurred either by accident or by corrosion, and also to long narrow holes, as a slit, tear, or cut in a plate.

Small holes of a square or ragged shape can easily, by the usual means of a Rimel punch or any round instrument, be made perfectly round. To repair them, take a piece of lead pipe of sufficient weight, the external diameter of which will correspond with the hole prepared for it in the plate; taper the pipe into a conical shape at end after the form of a rifle bullet, making it gas-tight in the tapering. Cut off about one inch in length from point, and at the other or wide end of this short conical-shaped plug, throw back a ruff or flange as large as you can get without cracking or destroying the pipe; paint the plug and round the hole into which it is to be fitted with white or red lead paint, and put a little putty or cement on underside of flange or ruff. Having the plug a tight fit, you drive it home by striking it with a flat piece of wood; then by inserting into the cone a tumpkin or punch, by a few strokes you press out the mouth of the cone till the edge of the holder plate cuts into the lead all round, when it will be found so tight that it is impossible to take it out without destroying it. Then taper off the edge of the lead flange that rests on the surface of the holder plate with a suitable hammer, and fill up the empty space with putty. After painting it over, the surface is so flush that the place where the repair is made will be scarcely observed, nor recognized as a patch. Should the hole exceed one inch in diameter, insert a well-seasoned hard wood plug into the inside of the cone flush with plate, cementing it over, and painting as above described. If the hole is of an oval shape, the cone is dressed oval to suit; if it is of the nature of a slit or tear in the plate, take a piece of lead pipe of sufficient weight, and of the proper length, cut it open up the one side, form it into a wedge shape, dressing out the flange as before described, tapering the ends also, so that when forced into the hole the ends as well as the sides will fit tightly. Wedge out the lead against the edges of the hole in the holder plate, and fill up the outside space of lead wedge by driving in lead bats about every inch in length of the hole to keep the wedge secure, finishing it off in the same manner as the others.

In repairing round, oval, and long holes, I have used the means just described, and with worn-out holders I have made them perfectly tight. This method is very speedy, and when all things are ready for the operation it is only the work of a few minutes, entailing a very little loss of gas, besides making a substantial job. I may add that the compound I used as putty, in this or other jobs of the kind, is a mixture of white or red lead, patent drier, and oil, with a quantity of pounded burnt freestone; by the freestone absorbing the oil from the putty, it becomes perfectly hard in a few hours.

A model of several sizes and shapes, illustrating the paper, was handed round to the meeting. There being no discussion,

The PRESIDENT said: I have here a notice of another method of repairing holes in gasholders, kindly sent to the meeting by post, by a party whom I might almost call anonymous, as we do not know him—whether he be connected with gas-works or not. From the beginning of his letter, I am inclined to think he had seen the notice of our meeting and subjects kindly inserted in the local *Hamilton Advertiser* by our friend, Mr. Dunlop, of the gas-works here. The words of the letter are:—"The enclosed model is a plan that an old man adopted who had charge of the gasholders at Brigton, Glasgow, who died a number of years ago, and was then upwards of 70 years of age. If there is any simpler method than Archibald Aitkens's, I will be glad to hear of it.—Signed, JAS. ROBERTSON." [The model, which was neatly got up, was then handed round the meeting.] This is a very ingenious and very common way—namely, that of cutting the hole in the holder of an elongated nature, and inserting a Tee-piece the long way of the hole, and turning the screwed Tee round, so that the crosspiece lies across the hole, on inside of the holder, then by putting on the outside, with red lead, a piece of plate sufficient to make a joint, and screwing it up with a nut. I have to thank this gentleman for his communication so kindly sent.

A vote of thanks was given to Mr. John Hall for his paper.

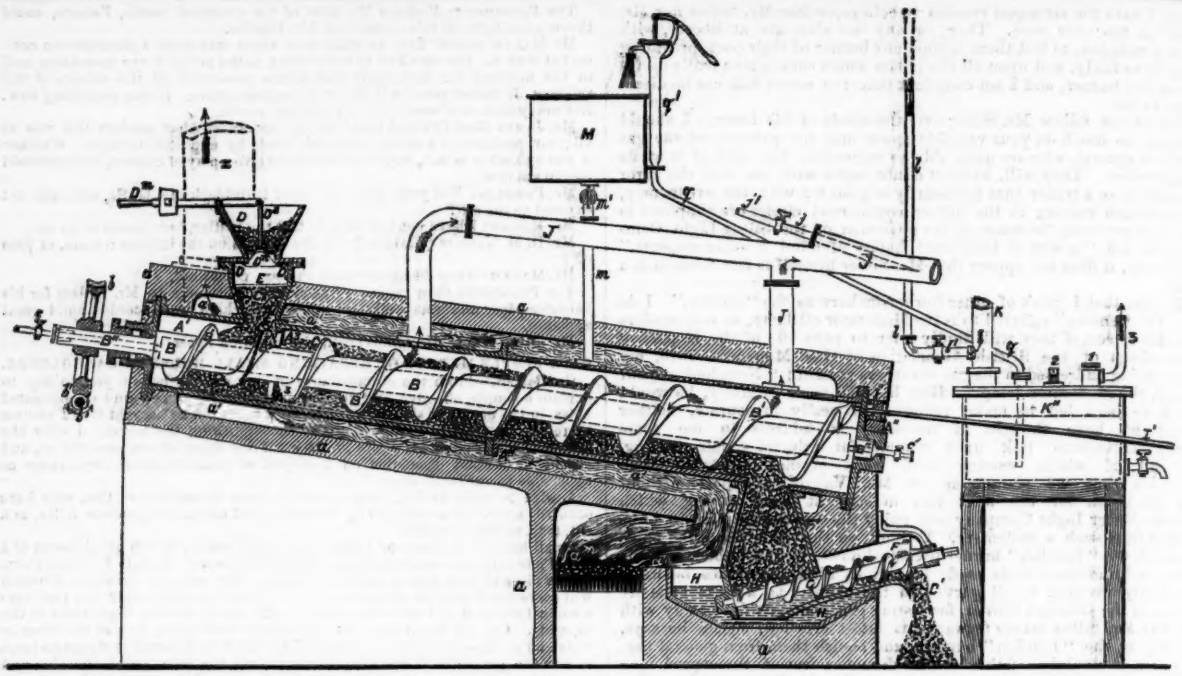
Mr. JOHN PATISON (Airdrie) read the following paper on

A PATENTED OVEN AND RETORTS FOR DISTILLING COAL AND SHALE.

Gentlemen,—I shall endeavour shortly to lay before you a few of the leading features aimed at in my patent for distilling coal now laid before you, and first it may be well to examine the apparent defects of the present system. It must be clearly understood that I call them apparent, as I do not pretend absolutely to assert that, in practice, the present modes of working have as yet been superseded; and, while also admitting that much has been recently done in the right direction, both by patented hydraulic machines, which are said to effect a saving in labour of about 50 per cent., as well as by other carefully devised plans, still it will be my object in the present cursory notes to try and suggest (for your approval) a better system.

I think any improvements likely to be successful must embrace—First, a decrease in the expense of working the material distilled; and, second, a greater yield of gas from the same. Now, as to the first, the usual plan of throwing the coal into a highly-heated retort seems to labour under the disadvantage of a heavy loss of the gaseous products before the retort door can be closed; and, considering the number of retorts used in a gas-work of any size, as well as the different charges introduced in the course of 24 hours, in the aggregate the loss may amount to more than one would at first be disposed to admit.

Again, owing to the laborious nature of the work caused by drawing the highly-heated charge, the workmen employed naturally expect a good pay; and I need hardly say that any improvements that aim at a simpler and more expeditious method ought, in your own interests, to receive at least a fair attention. The screw, by admitting the coal at the one end of the retort by



means of a hopper, and carried forward to the other end by a slow but continuous process, and discharging the residuum in water, which again may be drawn out either by the hand or another screw, seems to attain these ends. I intend, gentlemen, being very brief, and it will not be expected of me here to enter fully into the whole *modus operandi* of the working; but, suffice it to say that, with the aid of the drawings and printed process I have now put into your hands, as well as my being willing to afford all further explanation to parties intending to make use of the same, this will be sufficient for the present. And I observe further that I am willing to extend my legal rights to the patent to a few gas companies, free of all charges or licence, so as thereby more effectually to introduce the same to the public.

It has been objected to by some that the screw would not be likely to stand the high heat as well as the coarse usage it might receive. Now, I observe that the toothed screw at the entrance, as well as the hopper, may all be placed outside the retort, where there is little or no heat, and where the heavy work is done. Again, by having the retorts placed at a nearly perpendicular position, and having only a few very small partial screw-blades here and there down the centre, so as to prevent the material operated on being impeded, I think this dreaded difficulty may be done away with. And, to prevent the residuum of the distilled coal being discharged too quick, a full section of screw can be placed at the bottom.

Another difficulty in the way may appear, that, in admitting the coal from the outside receptacle into the hopper, at the entrance, an escape of gas may be expected at each introduction of fresh coal; but the coal, in falling down, may, to a great extent, check this, and the whole being done so quickly, I think this may not be looked upon as any formidable obstacle. However, by some simple contrivance, a more effectual way may be employed, by others better qualified than myself, to do away with any escape of gas when admitting a fresh charge.

I would now only further notice the mode of mixing or grinding oil with coal to form a portable gas-producing substance. So far as I see, in this process a large portion of the hydrocarbon compounds are wasted by the oxygen of the coal. The elements of common coal being of a somewhat complex nature, and the hydrocarbon compounds being produced (so far as I can see from experiments made) in the nascent state at the moment of the liberation of the hydrogen and oxygen from the coal, that they present themselves in such a ratio as to form water by their combination, to the manifest destruction of the very gas sought to be formed. But further trials are required. I only throw out a hint in this direction.

Now, these last-mentioned remarks will, I think, enable you more clearly to determine the advantages to be gained by another feature of my improvements, and that is the introduction of crude hydrocarbon oils, during the actual process of distillation, in conjunction with common coal or coal dross.

In order to prevent the oxidation and consequent loss of the hydrocarbons, a step, I think, is attained in the right direction in these improvements by first distilling off the watery compounds from the coal, and then introducing the oils on the same while the coal is in a highly-heated state; and, for this purpose, the oils are recommended to be let on at a point in the retort about the middle (as indicated in the specification), and by having two outlet-pipes on each retort, the watery compounds, to a great extent, are expected to escape by the one, and the hydrocarbon or oily vapours by the other. These, again, are carried through a highly-heated oven or clay retort, and decomposed into permanent gas. The cost per 1000 feet seems to lead to a success in my arrangement.

Mr. PATISON further said: The two objects which I aim at are, first, a decrease in the expense of working; secondly, a greater yield of gas. Mr. Malam's process, which I have heard explained to-day, is quite in keeping with my views, and a valuable acquisition to my knowledge. When I had charge of the acetic acid works in Musselburgh, I once passed the vapours of wood through a red-hot pipe, and was perfectly astonished at the amount of good illuminating gas obtained. There is by ordinary methods of gas manufacture a considerable loss of gas before all the lids are closed, and that takes place several times a day. High pay, too, has to be given for the drawing and charging of highly heated charges. I think I may be called the father of the shale-oil trade. Mr. Young was contemporary, but his arrangement was for coal, while mine was for shale. This patented arrangement was principally and primarily for distillation of oil at low heats, but to have two strings to my bow I included gas. It may be objected that the screw would not stand heat and hard usage, but the journals may all be placed outside the retort, or the retort may be placed almost perpendicularly, with small sections of screw-plates only here and there, and a full section of screw at the bottom, to prevent the charge from falling out too rapidly. The partial screw-plates may be made very strong. My invention is for working the retort with screw at low heats; and afterwards, as with Mr. Malam's, the oily vapours have to be conducted over hot bricks in a separate and highly heated retort. Speaking of mixing oil with coal dust, to form a portable gas producing substance, so far as I can see, in this process a large portion of the hydrocarbons are wasted by the oxygen of the coal. According to any experiments I have made when working a charge with a mixture of oil and dross, there is a loss inside of the retort, because the elements of water present themselves in the nascent state to form water, to the manifest destruction of the gas sought to be made. First distil the watery compounds, and then introduce the oil when the coal is in a highly heated state. I have two outlet-pipes on the first retort, one for watery matter, the other for hydrocarbons.

The PRESIDENT: Mr. Patison must receive great credit for the ingenuity of his arrangements and inventions. I see some members in this hall who have worked methods similar to parts of this arrangement. Mr. Patison aims at a vital thing, viz., "stoking by machinery," to avoid fluctuations due to conditions of the labour market. This winter in Dumbarton, instead of having six or seven stokers to do the stoking, I have had 40 or 50 men or boys, picked up on an hour's notice, who would throw on their coats and demand their money if checked for their furnace being black; therefore designs for working with as little manual labour as possible must be sought. In this arrangement even cheap female labour could be employed by communicating the levers of the hoppers to the outside of the building, who could continuously go over the house lifting them every half hour or so, while men would be employed to stoke the fires.

Mr. NELSON remarked that the matter was very interesting, and the idea not a new one. There were some old engineers in Glasgow, who had the notion of a screw, but could not get a metal suitable. There was this difficulty as regards Mr. Patison's process, that low heats made tar, but not gas. The party he referred to, however, hoped to produce a metal with the requisite qualities, and then they would have a self-acting and safe method.

Mr. D. B. PEEBLES: Mr. Patison's is an ingenious arrangement, no doubt; but discoveries will be made and remade; people working in the same field will find out the same things, and use similar methods. Two inventions are combined in Mr. Patison's. Screws have been in use; but there is one feature indeed of this arrangement—namely, the application of water in the screw—which would prolong the life of the screw if it did not interfere with the heat. Again, I have seen the hopper, as in Mr. Scott's method, at the Musselburgh Gas-Works, which was simply and easily worked, involving little manual labour. Filling the hopper and drawing the spent charge from a pit with water in it, is all that is required. So far as I can judge, these two patents are involved in Mr. Patison's. I do not think that Mr. Patison has seen either of these, and it is almost sad to see ingenuity, as it were, wasted.

Mr. NELSON: The diagonal position of the retort is the best assistance it can receive. The horizontal retort is not so effective.

Mr. PEEBLES stated that the retort he had referred to was perpendicular.

Mr. PATISON referred shortly to "Porter and Lane's patent," and said there was less chance of his own method going wrong, the retorts being set at an angle of 45 degrees, and working at a low heat; that this was the distinctive feature, the conducting of the vapours over hot bricks, and offered the free use of his legal rights to his patent to several gas companies who should adopt it, and recommended it most to England.

Mr. Patison received a hearty vote of thanks for his communication.

The PRESIDENT moved a vote of thanks to the managing committee of the Corporations of Hamilton and Dumbarton, who were present as visitors, and to the Hamilton Corporation, in particular, for use of the hall.

The vote was cordially adopted.

Before the meeting closed, the PRESIDENT called attention to the subject of gas managers expenses in attending such conventions, and said, if the meeting approved of it, the committee intended to issue circulars, with, or shortly after, those decided on at the beginning of the meeting, asking the companies to defray these expenses. He thought that the advancement of knowledge this brought about would repay them many times over.

On the motion of Mr. NELSON, the president received a vote of thanks for his conduct of the meeting.

Mr. LOVE, of Glasgow, exhibited specimens of gas-reflectors, as well as models of fire and ice escapes.

Specimens of products of tar distillation were on the table, exhibited by Mr. Ross, Falkirk.

Sixty-two members attended the meeting, and at the close of the business, they proceeded to the grounds of the Duke of Hamilton, where the palace, mausoleum, and gardens were visited.

Subsequently, upwards of 50 members dined together most comfortably, at Spalding's Commercial Hotel—Mr. William Key in the chair; D. B. Peebles, Esq. (Edinburgh), and Thomas Watson, Esq. (Lanark), croupiers.

After the usual loyal toasts, the British Association and North British Association of Gas Managers, and other toasts, were given; and a pleasant and agreeable evening was spent together.

PHŒNIX GASLIGHT AND COKE COMPANY.

The adjourned Half-Yearly General Meeting of Proprietors was held at the Bridge House Hotel, Southwark, on Wednesday, April 8—EDWARD HORNER, Esq., in the chair.

The SECRETARY (Mr. I. A. Crookenden) read the notice convening the meeting, and the minutes of the last general and special meetings and of the *pro formâ* meeting in January, of which the present was an adjournment.

The following report and statement of accounts were submitted:—

The directors herewith submit trade account and balance-sheet to the 31st of December last.

The directors report that the advantageous contracts for coals made in 1871 having for the most part run out, it has been necessary to purchase further supplies at greatly enhanced rates, which have unfavourably influenced the trade account for the half year, the profit made being £5717 less than the sum needed to pay the dividends.

Consequent upon the high price of coals, combined with the great depreciation in the value of coke, the directors have found it necessary to increase the price of gas to 4s. 6d. per 1000 cubic feet from the quarter terminating at Christmas last, a proceeding which they trust may only prove temporary.

The new gasholder at Kennington Lane has been completed, and is in successful operation.

The net amount of profit for the past half year is £31,407 7s., which, added to the unappropriated balance of £38,538 19s. 7d., makes a total of £69,946 6s. 7d. to the credit of profit and loss as per that account, out of which the directors recommend that dividends be declared as follows:—On the £20 divided shares, 10 per cent. per annum, £27,000; on the £20 new stock, 7½ per cent. per annum, £6525; on the £20 capitalized stock, 5 per cent. per annum, £3600; making a total of £37,125, less income-tax, leaving an unappropriated balance of £32,821 6s. 7d.

Dr. *Abstract of the Trade Account for Six Months ending Dec. 31, 1873.* *Cr.*

To Coals used			£87,691	13	9	
Materials supplied			17,385	9	6	
Meters—repairs and renewals			2,049	2	7	
Rates			3,646	14	2	
Directors, £1000; auditors, £50			1,050	0	0	
Salaries and commission on collection			4,918	13	8	
Pensions			921	2	2	
Wages			21,513	5	0	
Bad debts and allowances			168	9	9	
Interest on bonds			3,181	16	9	
Leasehold-fund			430	0	0	
Rents			501	18	11	
Interest			153	9	8	
Insurance			160	7	0	
Net profit			31,407	7	0	
			£175,179	9	11	

By Rental					£122,997	5 8
Coke					43,973	3 10
Breeze					508	1 9
Tar					2,868	5 4
Ammonia					2,307	14 7
Rents					1,527	9 0
Miscellaneous receipts					821	4 7
Interest					176	5 2
					£175,179	9 11

Profit and Loss.

October, 1873.—To dividend for half year ended June 30, 1873					£36,675	0 0
Dec. 31, 1873.—To balance to be carried to next account, and subject to half year's dividend to the 31st of December last					69,946	6 7
					£106,621	6 7

July, 1873.—By balance brought forward					£75,213	19 7
Dec. 31, '73.—By half year's profit					31,407	7 0
					£106,621	6 7

Dr. *Abstract of the Balance-Sheet, Dec. 31, 1873.* *Cr.*

To Capital of 27,000 £20 shares, paid in full (maximum dividend 10 per cent.)			£540,000	0	0	
Capitalized stock, paid in full (maximum dividend 5 per cent.)			144,000	0	0	
New stock, £360,000, £55 per cent. paid up (maximum dividend 7½ per cent.)			198,000	0	0	
Bonds, at 5 per cent.			145,000	0	0	
Unpaid dividends			119	4	3	
Unpaid tradesmen's bills, &c.			24,681	1	9	
Leasehold-fund			19,189	17	6	
Reserve-fund			16,120	6	4	
Balance of profit and loss—						
Unappropriated balance		£38,538 19 7				
Half year's profit		31,407 7 0				
			69,946	6	7	
			£1,157,056	16	5	

By Amount of plant on June 30 last					£918,017	4 8
Expended this half year for extension of works					16,124	13 8
					£934,141	18 4
Investment of leasehold-fund					19,189	17 6
Reserve-fund					16,120	6 4
Amount of call unpaid					200	0 0
Amount due for rental—						
Christmas quarter			£31,268	17 8		
Arrears			627	5 6		
					31,896	3 2
Amount due for coke and breeze			£15,646	5 4		
Ditto tar			1,385	15 0		
Ditto ammonia			1,735	4 0		
Ditto sundries			3,772	0 6		
					23,039	4 10
Stock of coals			£19,752	14 4		
Ditto coke			3,940	16 0		
Ditto breeze			58	15 0		
Ditto tar			277	15 1		
Ditto ammonia			272	8 8		
Ditto retorts			270	16 2		
Ditto pipes			856	10 6		
					25,429	15 9
Meters					41,916	6 11
Balance at treasurer's					5,123	3 7
Ditto on deposit					10,000	0 0
					£1,157,056	16 5

The CHAIRMAN moved—"That the report and accounts be received and adopted and entered on the minutes." He thought that if any gentlemen present had examined the accounts, they would see that there was something very unusual in them to any accounts ever before submitted by the directors, inasmuch as it would appear that a sum of £87,691 had been paid for coals, which was an absolute increase of £24,664 beyond the amount so paid in the previous half year, and £18,772 more than was paid in the corresponding half of 1872. Of course, this most materially affected the accounts of the company, inasmuch as, on the other side, the receipts for coke were only £10,100 additional, so that the company were actually worsted to the extent of upwards of £8000. He believed the price realized for coke during the past year had taught gas companies the lesson that that price, in reality, bore no relative proportion to the price of coals. The directors had fondly hoped that time would have so adjusted the price of this product that the company would not have sustained any great loss from the difference between the price of a ton of coal and the returns they would obtain from a chaldron of coke. But this company, in common with others, had had the lesson forced upon them that these two things bore no relation at all to each other. Coke seemed to be a distinct article, and dependent upon a demand which, unfortunately, was of that nature that the price could not in any way be controlled. It was an article which it was impossible to stock to any great extent, so that occasionally companies were obliged to accept very low prices for it. Again, unfortunately for gas companies, the last winter was of an extremely mild character, so that the demand was much restricted. The cost of coals during the past six months was 5s. 9d. per ton more than in the previous six months, while the price of coke was not so good, taking the last half year throughout, as in the former period. With this exception, there was everything in the accounts now presented with which the shareholders might well be satisfied. Comparing the items of expenditure with those of the previous six months there was but little increase, except in the items of wages and materials supplied. Iron, which was an important element in gas-works, was double the price it formerly was; but this had not affected the Phœnix Company to as great an extent as might be supposed. Among the receipts, the tar, breeze, and ammonia, although they produced something, were all of very small moment compared with the item of coke. No doubt the shareholders had observed that the directors had been obliged to give notice of an increase in the price of gas. Naturally the public did not like it, but every one must be perfectly well aware that gas could not be supplied at the same rate when coal was at 26s. per ton as when it cost only 14s. The directors hoped that the increase in the price of gas was only a temporary measure, and that the coal-owners in the North would soon be induced to take more moderate rates for coal, for certainly recent rates had been enormously in excess of those which the cost of production required. If any agitation existed amongst the public, it should not be against the gas companies, but against the coalowners, for it was they who had driven the companies to raise the price of gas by the great advance made by them in the cost of the raw material. He believed that gas companies generally were conducted with the greatest economy, and, to show how very regular the working of the Phœnix Company proceeded, he might mention that the waste by unaccounted-for gas had scarcely varied. Independent of the gas consumed at the works, the unaccounted-for gas was but very little over 7 per cent., and it was a very singular thing that the quantity of gas sold last half year only varied 4 feet per ton over what it was on the last occasion. This showed that the pipes, generally speaking, must be in very good order, or such exceeding regularity could not have been maintained. The quantity of gas amounted to very nearly 9000 cubic feet per ton, which he thought could not be found fault with, especially in an old company, in some portions of whose district the pipes might be expected to be defective, and give rise to occasional losses which it was impossible to avoid. Upon the whole, he thought that the affairs of the company were of a satisfactory nature. The intimation the directors had been forced to make of an increase in the price of gas had not called forth any very strong feeling on the part of the public, and, indeed, they must have been pretty well prepared to pay more for an article which they knew cost more money to produce than formerly. And he was sure the consumers would feel that the directors of this company, not having raised the price so soon as some other companies, would act with perfect justice, and be as eager to reduce the price, as soon as practicable, as they were unwilling to increase it until the necessity was absolutely forced upon them.

Mr. HOBSON seconded the motion with much pleasure, as he considered that under the circumstances through which gas companies had had to pass the report was most satisfactory. Coals now had a decidedly downward tendency, and he trusted that the worst trials of gas companies in respect of the price of coal were pretty well at an end. Although he did not expect a very much greater reduction at present, the change which had taken place would make some thousands of pounds difference to this company in the course of a year. Iron was always tending downwards in price, although the reduction was not very material. He was very hopeful that gradually gas companies would be able to resume their former moderate prices, although he admitted that existing rates were not higher than circumstances warranted. He was quite sure the shareholders of this company were in accord with the chairman, who said it would be a pleasure to reduce the price as soon as practicable, and he knew enough of the gentlemen at the board to justify him in saying that, while desirous to secure the interest of the shareholders, they had never been unmindful of the interests of the public.

The motion was then put and carried.

Mr. SHAND (deputy-chairman) moved—"That dividends for the half year ending Dec. 31 last be, and the same are hereby declared and made out of the profits of the undertaking, at the following rates:—On the original shares at the rate of 10 per cent. per annum, on the capitalized stock at the rate of 5 per cent. per annum, and on the new stock at the rate of 7½ per cent. per annum, less income-tax in each case; such dividends to be payable to the bankers of the proprietors so ordering it, and the remaining dividends to be forwarded by post."

Mr. HARRIS seconded the motion, which was put and carried.

The CHAIRMAN said he had now to ask the meeting to concur in a motion which was a little out of the ordinary course. It would be in the recollection of some of the shareholders that when the late secretary, Mr. Pridden, retired, a pension was voted to him at a general meeting like the present. The Act of Parliament gave the directors entire power to deal with such a matter as that without consulting the shareholders, but the board thought in that particular instance it would be more agreeable that the vote should come from the shareholders as a body. Since Mr. Pridden's pension was agreed to various Acts of Parliament had been passed, containing a fixed scale under which retiring officers in a company of this kind received an amount of superannuation in proportion to the length of their services. That scale would give the late secretary a better pension than the one voted to him, and as the directors had adopted that scale in determining the pensions of other officers, they thought it was only just, considering that Mr. Pridden was for 40 years in the service

of the company, that he should receive such a pension as he would be entitled to if he retired at the present moment. He would, therefore, move—"That the pension of the late secretary be assimilated to the scale adopted by Parliament—viz., two-thirds of his salary after a service of upwards of 20 years."

Mr. Down seconded the motion, believing it to be only an act of justice to an old officer like Mr. Pridden, who wore himself out in the service of the company, that he should be placed in as good a position as others who had more recently retired.

The motion was put and carried unanimously.

Mr. Pridden said he felt grateful to the chairman for the manner in which he had proposed, and to the shareholders for the manner in which they had accepted, the motion. He had, as Mr. Down said, worn himself out in the service of the company; but if his advice or knowledge could at any time be usefully rendered, he should gladly be at the call of the directors. He believed that the granting of a pension to old officers like himself, who resigned on account of ill health, was a stimulus to good and faithful work for the younger officers yet in the employ of the company.

The chairman having vacated his seat, Mr. Hobson was called upon to preside, and it was moved, seconded, and resolved that the whole of the retiring directors and auditors be re-elected. It was also resolved that Mr. Horner be again appointed chairman and Mr. Shand deputy-chairman of the company.

Mr. Horner, having again taken the chair, returned thanks for himself and colleagues, and expressed a hope that when next they met the shareholders they would be in a position to make a more favourable report as to the state of the gas world generally than they had been able to do on this occasion.

A vote of thanks having been given to the directors for their services, the proceedings terminated.

SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

The Ordinary General Meeting of Proprietors was held at the London Tavern, on Tuesday, April 7—Thomas B. Simpson, Esq., in the chair.

The Secretary (Mr. G. Livesey) having read the notice convening the meeting, and the minutes of the last meeting, the corporate seal was affixed to the register of shareholders, and the following report and statements of account submitted:—

The directors have to report that the business of the company has been satisfactory during the half year.

The price of coal has been higher than at any previous period, the total amount paid for this article having exceeded the cost in the corresponding half of 1872 by upwards of £19,060, while the increased receipts from products amounted to £10,800 only. In addition to this there have been some heavy exceptional charges against the revenue account for repairs, &c., amounting to nearly £3000; of this sum upwards of £1500 has been spent in thoroughly repairing a gasholder-tank and in strengthening the gasholder. Notwithstanding these drawbacks, the directors have the satisfaction of informing you that they have not found it necessary to increase the price of gas.

The demand for gas increases rapidly; this entails a continual outlay for new mains and manufacturing plant. The directors have therefore considered it prudent to begin another large tank for a gasholder, to be ready for use by the winter of 1875.

The accounts annexed are presented in the form prescribed by the Board of Trade. The net profit for the half year amounts to £9853 2s. The usual dividend will require £16,482 18s. 6d.; the deficiency will be taken from the balance standing to the credit of the profit and loss (revenue) account No. 4.

By the company's Act of Incorporation one director retires from office at this meeting, and also one auditor.

Julian Hill, Esq., as director, and F. Simpson, Esq., as auditor, will therefore retire, but these gentlemen, being eligible, offer themselves for re-election.

No. 1.—STATEMENT OF SHARE CAPITAL *to Dec.* 31, 1873.

Acts of Parliament authorizing the Raising of Capital.	Description of Capital.	Maximum Dividend authorized.	Number of Shares issued.	Nominal Amount of Share.	Called up per Share.	Total paid up.	Amount not paid up.	Total Amount authorized.
5 Vict., cap. 79	Share.	10 per cent.	4,000	£50 0 0	£50 0 0	£200,000 0 0	..	£200,000 0 0
			4,000	12 10 0	12 10 0	50,000 0 0	..	50,000 0 0
32 & 33 Vict., cap. 130	Do.	Do.	20,000	12 10 0	5 0 0	98,975 10 0	£151,024 10 0	250,000 0 0
						£348,975 10 0	£151,024 10 0	£500,000 0 0

No. 2.—CAPITAL ACCOUNT, *for the Half Year to Dec.* 31, 1873.

Dr. *Cr.*

	Expended to June 30, 1873.	Expended this Half Year.	Total expended to Dec. 31, 1873.
To Amount expended to June 30, 1873	£309,262 17 5	..	£309,262 17 5
Manufacturing plant	..	£9,995 6 1	9,995 6 1
New meters and fixing	..	599 2 10	599 2 10
New mains and laying	..	3,354 10 10	3,354 10 10
Balance	..	..	25,763 12 10
	£309,262 17 5	£13,948 19 9	£348,975 10 0

	Certified to June 30, 1873.	Received this Half Year.	Total to June 30, 1873.
By Shares, at £50 each	200,000 0 0	..	£200,000 0 0
Do., at £12 10s. each	50,000 0 0	..	50,000 0 0
Do., at £12 10s. each, £3 10s. paid	70,000 0 0	£28,975 10 0	98,975 10 0
	£320,000 0 0	£28,975 10 0	£348,975 10 0

No. 3.—REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1873.

Dr. *Cr.*

To Manufacture of gas—			
Coals, including dues	£52,113 2 9		
Purifying material, oil, and water, and all other incidental expenses of works	1,443 10 4		
Salaries of engineer, superintendent, and officers at works	488 14 0		
Wages at works	8,413 4 1		
Repairs and maintenance of works and plant, including renewal of retorts, machines, apparatus, materials, and labour	3,917 8 6		
	£66,375 19 8		
Less old materials sold	91 13 6		
		£66,284 6 2	
Distribution of gas—			
Repair, maintenance, and renewal of mains and service-pipes, including materials, laying and paving, and labour	£2,032 3 7		
Salaries of inspectors and clerks in light office	1,141 2 0		
Repairing, renewing, and refixing meters	1,176 15 11		
		4,350 1 6	
Public lamps—			
Lighting and repairing		1,324 10 7	
Rents, rates, and taxes—			
Rents	£284 18 5		
Rates and taxes	1,858 6 1		
		2,143 4 6	
Management—			
Directors allowance	£502 10 0		
Salaries of secretary and clerks (except in light office), messengers	700 0 0		
Collectors commission	543 19 1		
Stationery and printing	171 18 0		
General establishment charges, and incidentals	683 1 10		
Company's auditors	49 7 6		
		2,740 16 5	
Law and parliamentary charges		Nil.	
Bad debts		231 10 0	
Superannuation-fund		254 12 0	
Board of Trade expenses		64 19 7	
Total expenditure		£77,394 0 9	
Balance carried to profit and loss account		9,853 2 0	
		£87,247 2 9	

By Sale of gas—		
Common gas (per meter, 313,642,800)	£46,955 0 5	
Public lighting and under contracts	6,634 16 1	
		£53,589 16 6
Residual products—		
Coke	£27,583 8 1	
Breeze	743 9 6	
Tar	2,215 19 5	
Ammoniacal liquor	3,177 9 9	
	£33,720 6 9	
Deduct labour for loading products	649 1 3	
		33,071 5 6
Rents		203 1 8
Transfer fees		2 2 6
Other items		380 16 7
		£87,247 2 9

No. 4.—PROFIT AND LOSS ACCOUNT (Revenue).

Dr. *Cr.*

Oct. 6, 1873.—To Dividend, June 30, 1873	£16,900 0 0	June 30, 1873.—By Balance	£34,567 8 4
Dec. 31, 1873.— Balance	28,420 10 4	Dec. 31, 1873.— Revenue account	9,853 2 0
	£44,420 10 4		£44,420 10 4

No. 5.—RESERVE-FUND.

Dr. *Cr.*

Dec. 31, 1873.—To Balance	£20,000 0 0	June 30, 1873.—By Balance	£20,000 0 0

No. 6.—RENEWAL-FUND (Leasehold).

Dr. *Cr.*

Dec 31 1873.—To Balance	£9,016 16 5	June 30, 1873.—By Balance	£8,875 3 3
		July 25, 1873.— Cash	141 13 2
	£9,016 16 5		£9,016 16 5

No. 7.—COALS CARBONIZED *to Dec.* 31, 1873.

Description of Coal.	In Store, June 30, 1873.	Received since.	Carbonized and Used.	In Store, Dec. 31, 1873.
	Tons.	Tons. Cwt.	Tons. Cwt.	Tons.
Common coal	7,551	39,871 14	38,794 14	8,628
Cannel coal	1,551	1,763 6	835 6	2,479
	9,102	41,635 0	39,630 0	11,107

No. 8.—RESIDUAL PRODUCTS MADE AND SOLD *to Dec.* 31, 1873.

Description of Residual.	In Store, June 30, 1873.	Made during the Half Year.	Used in the Half Year.	Sold in the Half Year.	In Store, Dec. 31, 1873.
Coke . . . Chaldrons	600	39,582	10,643	26,379	3,160
Breeze . . . Yards.	30	5,098	..	4,748	380
Tar . . . Gallons	13,120	383,000	34,000	349,220	12,900
Liquor . . . Butts	533	8,472	..	6,378	2,627

BALANCE-SHEET *to Dec.* 31, 1873.

Dr.		*Cr.*	
To Capital account, balance per account (No. 2)	£26,763 12 10	By Amount invested in Consols	£20,000 0 0
Reserve-fund, per account (No. 5)	20,000 0 0	Ditto ditto	9,016 16 5
Renewal-fund, per account (No. 6)	9,016 16 5	Cash at bankers	2,473 9 0
Profit and loss account, per account (No. 4)	28,420 10 4	Cash in hand for freight, accounts, &c.	600 0 0
Sundry creditors	6,865 3 8		
Deposits by consumers	2,619 13 1	Stock of coals	£17,036 5 8
Property-tax account	243 10 5	Ditto coke	2,249 5 0
Dividend account	276 13 8	Ditto tar and liquor	1,065 15 0
		Ditto mains and meters	2,568 11 5
			22,919 17 1
		Amount due for gas	£35,008 14 5
		Ditto products	2,713 16 5
		Ditto sundries	155 4 9
		Ditto interest	318 2 4
			38,195 17 11
	£93,206 0 5		£93,206 0 5

I certify that the above accounts are correct, and that there are no penalties or forfeiture to be deducted from the maximum dividend.
March 19, 1874. (Signed) CHARLES H. PARKES, Official Auditor.

The CHAIRMAN, in moving that the report and accounts be received and entered on the minutes, said he proposed only to offer a few remarks to the meeting. The shareholders must be thoroughly aware of the difficulties with which the directors had had to contend, arising out of the high price of coal and the increased price of iron. He was happy to state that, like other troubles which they had had to encounter in past times, they had been able to meet these difficulties also; and he trusted they would soon be in still waters again. The shareholders would see from the accounts that there was a deficiency in the profits of the last half year, so that there was not enough to pay the maximum dividend therefrom. He hoped, however, this circumstance would not make them uncomfortable, as he thought he could convince them that there was little to be apprehended. In the first place, however, he would remark that the directors had avoided raising the price of gas—a matter of great importance to the consumers and to the public in general. It was also a matter of great satisfaction to the directors themselves, and would be a source of congratulation to the shareholders. In order to make up the dividend on the present occasion, recourse was had to the balance of profits accumulated in past years, and a reference to the profit and loss account would show that there would still remain a surplus after so doing. In order also to show the very healthy state of the company, he would remind the meeting that even in the event of coals maintaining their high price, there was the reserve-fund, to which they could go to make up any future deficiency in dividend. The company, moreover, had the power to raise the price of gas an additional 6d. per 1000 without asking permission from the Board of Trade, and as, on the present occasion, if they had raised the price only 2d. per 1000, it would have made up the entire deficiency of profits, without resorting to the surplus of previous years and to the reserve-fund, he thought it would be seen that there was no cause for alarm. But even if all these resources should fail, the company had power to go to the Board of Trade and ask for such a revision of price and illuminating power as would enable them to secure to the shareholders their 10 per cent. Add to these facts the circumstance that year by year, as their consumers increased, their profits were increased likewise, and he need say no more to convince them that they possessed as sound a concern as any in the City of London. He made these remarks lest any new shareholders should feel apprehension on finding that the profits of the last half year were deficient, and to assure them that the company could bear a much heavier pressure than they had sustained before suffering any inconvenience. One other matter he wished to mention, and that was in reference to a call. Most likely the directors would have to make a call of 30s. per share in October next; there was no doubt they would want the money by that time, and indeed it was within the bounds of possibility that they might require it before. Should they have to ask for it sooner than the time he had mentioned, he hoped there would be no objection. There was one thing which had occupied the attention of the board lately, and that was whether the conversion of the shares of the company into stock would not be a convenience. Many of the companies had adopted that course, and the proprietors seemed pleased with it while the directors found that it worked well. At the same time he merely shadowed it forth at the present meeting; it was having the deep attention of the directors, and they might hereafter make a proposition on the subject. With these few remarks he would now move the adoption of the report.

Mr. JENKINS seconded the motion, which was put and carried unanimously.

Mr. REILY moved—"That a dividend at the rate of 10 per cent. per annum be now declared and made payable on the 10th inst., and that the warrants be transmitted by post to each proprietor."

Mr. MAY seconded the motion, which was put and carried.

Mr. ROSTRON moved the re-election of Mr. Julian Hill as a director. He had not the pleasure of personally knowing that gentleman, but if he had had any hand in contributing to the prosperous condition of the company, he was evidently a very proper person to be placed again on the board.

Mr. HENRY seconded the motion, which was at once agreed to.

Mr. HILL said he was much obliged for the honour just conferred upon him by his re-election. He could only assure the shareholders that his best efforts would be given in the future as they had been in the past, to maintain the prosperity of the company. While other portions of London had been disturbed by meetings held in opposition to gas companies, it was a source of satisfaction to him to find himself in the direction of an undertaking in which nothing had occurred to interfere with the cordiality which had so long existed between them and the public.

Mr. MALTBY moved and Mr. WALLINGTON seconded the re-election of Mr. Frederic Simpson as an auditor, which was put and carried.

Mr. F. SIMPSON, in acknowledging the vote, said he had for nine years filled the office of auditor, and it was to himself and to his colleague a great pleasure to discharge the responsible duties connected therewith, not only because the accounts were so admirably kept, but because year by year they witnessed the growing prosperity of the company. Although he had been auditor for only nine years, his connexion with the company extended over more than 30 years. During all that time he had seen the care and attention which his honoured father (the chairman) had bestowed upon the undertaking, by which he had contributed to raise it from comparative insignificance to be one of the most important in the metropolis, yielding to the proprietors the full dividend allowed by the Legislature, and securing to the public the largest possible benefits. Under such circumstances it could not be a matter of surprise that he himself took a great interest in the concern, and that he was a thorough believer, not only in the wholsomeness, but in the sweet fragrant perfume, of the South Metropolitan Gas Company. So long as he had the honour to enjoy the confidence of the shareholders, he should endeavour faithfully to perform the services they required at his hands.

Mr. ROSTRON asked if he rightly understood from the chairman that 2d. per 1000 cubic feet of gas would represent the deficiency in the profits on this occasion.

The SECRETARY said the deficiency on the year was £5800, and 2d. per 1000 would about represent that.

Mr. PAULL said, like his colleague, Mr. F. Simpson, he had been for many years connected with the company, as also was his father. He recollected the time when they were in great difficulties, and could pay no dividend at all. Owing to the zeal and assiduity of gentlemen on the other side of the table, and of some who had now passed away, the undertaking had since greatly prospered, and the shareholders were now enjoying the fruits of their labours with every prospect of the continuance of existing prosperity. The chairman had well set forth the resources of the company, and it must also be reckoned that they might obtain further advantages from the fall in the cost of iron, coal, and labour. During the past winter, owing to the mildness of the season, gas companies in London had not realized so much for coke as in previous years. Under all circumstances he thought they had much to congratulate themselves upon, and while congratulating themselves they must not be unmindful of the services of those by whose energy and ability the affairs of the company were so well conducted. He had much pleasure in moving a vote of thanks to the chairman and directors for their able management of the company's business.

A SHAREHOLDER seconded the motion, which was cordially adopted.

The CHAIRMAN, in acknowledging the compliment, said the directors were deeply sensible of the kindness always shown to them by the shareholders, and assured them of the continuance of their exertions to maintain the efficiency of the business confided to their care.

On the motion of Mr. PAULL, seconded by Mr. MAY, a vote of thanks was unanimously given to Mr. Livesey, the engineer and secretary,

Mr. LIVESEY said he was extremely obliged for this renewed expression of confidence and approval. He could assure the meeting that in carrying out the arduous duties which had devolved upon him since the death of his father, the knowledge of the appreciation of his services, which he had always experienced at the hands of the shareholders, had been a great encouragement and stimulus to exertion. Of late years his office had been no bed of roses. At present the company had difficulties to encounter, owing to the falling price of coke, but he hoped they would soon have an advantage in the falling price of coal, so as to enable them to pull through. He looked forward to the time when they would again reach the smooth waters in which for 20 years they had the happiness to sail.

SANDWICH GAS COMPANY.—The yearly meeting of this company was held on Tuesday, April 7, at their office on the works—Mr. Scott in the chair. Mr. Dorman (the secretary) read the report, which stated that the directors were much pleased that there was a balance to the credit of the profit and loss account, and as this profit has been earned during the last half of the year, since the appointment of Mr. Valon as engineer (with whose services the directors took that opportunity of expressing their great satisfaction, and whose alterations in the works had effected great economies in the manufacture), and as the improvement still continued, the directors felt justified in recommending a dividend at the rate of 4 per cent. per annum, which would absorb the whole amount of the profits, and also take a sum of £69 15s. from the balance of unexpended revenue. The chairman moved the adoption of the report, which was seconded by Mr. Bailey, who said he was glad they met under much better circumstances that day than twelve months previously. They were then without a dividend, now they could safely declare one; and as this had all been earned during the latter portion of the year, it was the more encouraging. When, twelve months since, he with others undertook the direction, they found everything in a most unsatisfactory condition, and they determined to call in Mr. Valon to see what was to be done; that gentleman had recommended such radical charges that they almost hesitated to follow his advice, but they resolved notwithstanding to let him go on, and, as the result proved, most wisely. The whole of their liabilities had been discharged, the alterations paid for, and a dividend earned in a marvellously short time, their works were now in good working order, and their prospects very encouraging; they had also been able to reduce the price of gas which he thought would be the means of pleasing the consumers as well as the shareholders. The report was carried.

LONDON GASLIGHT COMPANY.

The Ordinary Half-Yearly Meeting of Proprietors was held at the Freemasons Tavern, on Wednesday, April 8—J. R. Hall, Esq., the governor, presiding.

The Secretary (Mr. A. J. Dove) having read the notice and minutes, the following report and statements of accounts were presented:—

Annexed to this report your directors submit the half-yearly accounts, showing the result of manufacture and distribution of gas up to Dec. 31, 1873. After appropriating £750 to the redemption-fund, in accordance with the provisions of the London Gaslight Act, 1857, the sum of £30,254 2s. 9d. remains applicable to dividend. Out of this sum, the directors recommend that dividends be declared on all classes of preference stocks and shares, and also a dividend at the rate of 10 per cent. per annum on the ordinary stock. Such dividends to be paid on April 15, 1874.

The past year, as you must be aware, has been one of anxiety to gas companies generally, coals having risen to prices quite unprecedented.

The accounts will abundantly prove that the advance made last year in the price of gas was a step taken by your directors not only advisedly, but also that it was one of necessity. In comparing the accounts before you with those for the corresponding period of last year, you will find that, of the additional costs for coals, £15,000 has been met by the increased return for residuary products; leaving a sum approaching £20,000 to be supplied by the increased return for gas.

The increase of business has rendered advisable an enlargement of the works. An additional retort-house is therefore in course of erection. In part to meet this outlay a call has been made upon class A shares, which became payable on the 31st ult.

Mr. Christie, one of the directors, who has for so many years been associated with the company in the various phases through which it has passed, and whose judgment was much respected at the board, having retired from the direction, the vacancy has been filled by the election of Miles Miley, Esq., an appointment which the directors believe will be approved by the shareholders.

Three directors—namely, Robert Rawlinson, C.B., the Hon. Henry Noel, and William Irving Hare, Esq.—retire by rotation, and, being eligible, offer themselves for re-election.

One auditor—namely, George Pearson, Esq.—also retires by rotation, and, being eligible, offers himself for re-election.

The appointment of Mr. Miley to the direction creates a vacancy in the auditorship, which the shareholders may, should they think fit, fill up at this meeting.

A.—STATEMENT OF STOCK AND SHARE CAPITAL, *on Dec.* 31, 1873.

1. Acts of Parliament authorising the Raising of Capital.	2. Description of Capital.	3. Maximum Dividend authorized.	4. Number of Shares issued.	5. Nominal Amount of Share.	6. Called up per Share.	7. Total paid up.	8. Amount issued but not paid up.	9. Remaining to be issued.	10. Total Amounts authorized.
15 Vict., cap. 82	Ordinary stock	10 per cent.	Stock	Stock	Stock	£378,350	..	..	£378,350
	2nd pref. ,,	6 ditto.	Do.	Do.	Do.	14,450	..	..	14,450
	3rd ditto ,,	6 ditto.	Do.	Do.	Do.	4,350	..	..	4,350
	1st ditto ,,	6 ditto.	Do.	Do.	Do.	150,000	..	..	150,000
29 Vict., cap. 55	A ditto shares	6 ditto.	7622	£25 0 0	£12 10 0	148,347	£42,203	£109,450	300,000
30 & 31 Vict., cap. 73	Debenture stks.	5 & 6 ditto.	Stock	Stock	Stock	26,805	..	..	26,805
						£722,302			

B.—STATEMENT OF LOAN CAPITAL, *on Dec.* 31, 1873.

1. Acts of Parliament under which borrowed.	2. Description of Loan.	3. Rate per Cent. of Interest.	4. Total Amounts borrowed at Dec. 31, 1873.	5. Remaining to be borrowed.	6. Total Amounts authorized.
15 Vict., cap. 82	Bond, &c.	4½ and 5.	£91,667	..	£91,667
29 Vict., cap. 55	Ditto	Do.	41,725	£46,132	100,000
			£133,392		

Total stock and share capital paid up (*see* A), £722,302; ditto loan ditto borrowed (*see* B), £133,392; total capital received, £855,694.

C.—CAPITAL ACCOUNT, *for the Half Year ended Dec.* 31, 1873.

Dr. *Cr.*

		Total to Dec. 31, 1873.		Certified Receipts to June 30, 1873.	Received during Half Year.	Total Receipts to Dec. 31, 1873.
1. To Expenditure, to June 30, 1873		£798,870 6 0	1. By Ordinary stock	£378,350 0 0	..	£378,350 0 0
Since that date—			2. 2nd Preference ditto	14,450 0 0	..	14,450 0 0
2. To lands acquired, including law charges	£3,255 10 10		3. 3rd ditto ditto	4,350 0 0	..	4,350 0 0
3. New buildings, manufacturing plant, machines, storeage works, and other structures connected with manufacture	2,873 11 5		4. 1st ditto ditto	150,000 0 0	..	150,000 0 0
4. New mains and service-pipes, including laying same, paving, and other works connected with distribution	493 7 9		5. A ditto shares, £25 each, including amount received in anticipation of calls	147,930 0 0	£417 10 0	148,347 10 0
5. New meters, including fixing	624 8 3		6. Debenture stocks, under 20 & 21 Vict., cap. 73	27,750 2 6	*	26,805 2 6
		7,248 18 3	7. Bonds and other loans	129,192 0 0	†4,200 0 0	133,392 0 0
		£806,119 4 3				
6. Balance		10,755 2 6				
Total expenditure		£816,874 6 9				
To balance of capital account		38,820 5 9				
		£855,694 12 6		£852,022 2 6	..	£855,694 12 6

Note * £945 redeemed.
† £1000 ditto.

D.—REVENUE ACCOUNT, *for the Half Year ended Dec.* 31, 1873.

Dr. *Cr.*

To Manufacture of gas—			By Sale of gas—		
1. Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£81,999 3 11		1. Common gas (426,563,100 cubic feet), at 3s. 9d. and 4s. 6d. per 1000 cubic feet	£95,322 14 8	
2. Purifying materials, oil, water, and sundries at works	1,904 5 0		2. Cannel gas (21,850,400 cubic feet), at 5s. and 6s. per 1000 cubic feet	6,478 12 3	
3. Salaries of engineers, including chief engineer, superintendents, and officers at works	1,575 12 0		3. Public lighting and under contracts (common and cannel gas)	10,652 7 5	
4. Wages and gratuities at works	11,091 16 0				£112,453 14 4
5. Repairs and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, and labour	8,970 11 5		4. Rental of meters		1,904 12 0
	105,541 8 4				114,358 6 4
Less old material sold	51 10 5		By Residual products—		
		£105,489 17 11	5. Coke, less labour and cartage	36,527 18 9	
5a. The Gaslight and Coke Company, for cannel gas		6,646 4 0	6. Breeze, ditto	1,378 13 9	
Distribution of gas—			7. Tar, ditto	4,992 18 6	
6. Salaries of surveyor, chief inspector, inspectors, assistant inspectors, and clerks in Light Office	1,802 10 0		8. Ammoniacal liquor, ditto	2,960 12 7	
7. Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	1,485 6 4				45,860 3 7
8. Repairing, renewing, and refixing meters	2,172 0 1		9. Rents		1,414 5 0
		5,459 16 5	10. Transfer fees		6 0 0
Public lamps—					
9. Lighting and repairing		1,575 16 6			
Rents, rates, and taxes—					
10. Rents	939 9 6				
11. Rates and taxes	2,707 19 2				
		3,647 8 8			
Management—					
12. Directors allowances	900 0 0				
13. Salaries of secretary, accountant, and clerks, office-keepers, and messengers	932 0 0				
14. Collectors commission and salaries	1,133 19 4				
15. Stationery and printing	357 19 11				
16. General establishment charges and incidentals	1,315 1 4				
17. Company's auditors	75 0 0				
		4,714 0 7			
Law and parliamentary charges—					
18. Law	90 19 1				
19. Parliamentary (oppositions)	..				
		90 19 1			
20. Depreciation-fund for works on leasehold lands		100 0 0			
21. Bad debts		723 18 3			
22. Repairs of houses		472 17 1			
Total expenditure		128,920 18 0			
Balance carried to profit and loss account (E)		32,717 16 11			
		£161,638 14 11	Tota receipts		£161,638 14 11

E.—PROFIT AND LOSS ACCOUNT (NET REVENUE), *for the Half Year ended Dec. 31, 1873.*

Dr.		*Cr.*		
1. To Interest on temporary loans and bonds	£3,509 15 6	1. By Balance of net profit brought from last account	£30,792 8 1	
2. Redemption-fund, reserve per London Gaslight Act, 1857	750 0 0	Less dividend paid for the half year ended June 30, 1873	29,682 17 8	
Balance of net profit to be carried to next account, subject to half year's dividends	30,254 2 9			£1,109 10 5
		2. Balance brought from revenue account (D), being profit for the half year, to Dec. 31, 1873		32,117 16 13
		3. Interest on moneys deposited		96 10 11
	£34,513 18 3			£34,513 18 3

F.—RESERVED FUND ACCOUNT, *for the Half Year ended Dec. 31, 1873.*

Dr.		*Cr.*	
To Balance	£20,814 0 6	1. By Balance brought from last account	£20,485 17 6
		2. Interest on amount invested	329 3 0
	£20,814 0 6		£20,814 0 6

G.—DEPRECIATION-FUND ACCOUNT (for Works on Leasehold Lands), *for the Half Year ended Dec. 31, 1873.*

Dr.		*Cr.*	
To Balance	£1,000 0 0	1. By Balance brought from last account	£900 0 0
		2. Amount brought from revenue account (D)	100 0 0
	£1,000 0 0		£1,000 0 0

H.—STATEMENT OF COALS, *during the Half Year ended Dec. 31, 1873.*

Description of Coal.	In Store, June 30, 1873.	Received during Half Year.	Carbonized or used during Half Year.	In Store, Dec. 31, 1873.
	Tons.	Tons.	Tons.	Tons.
Common	10,485	50,051	48,987	11,549
Cannel	1,683	2,379	3,488	574

I.—STATEMENT OF RESIDUAL PRODUCTS, *for the Half Year ended Dec. 31, 1873.*

Description of Residual.	In Store, June 30, 1873. Estimated.	Made during Half Year. Estimated.	Used in Manufacture during Half Year. Estimated.	Sold during Half Year.	In Store, Dec. 31, 1873. Estimated.
Coke—					
Common, Cannel	chaldrons, 458 / 36 bush.	49,090	11,998	32,185	5,385
Breeze	chaldrons. 55	5,549	674	4,409	521
Tar	gallons. 73,000	518,941	..	487,941	104,000
Ammoniacal liquor	butts of 108 g. 1,352	9,363	..	8,752	1,963

J.—GENERAL BALANCE-SHEET, *on Dec. 31, 1873.*

Dr.			*Cr.*		
1. To Capital account—			1. By Cash at bankers, and in hand		£12,553 19 1
Balance at credit thereof (Account C)	£38,820 5 9		2. Coals—for stock on hand	£1[illegible],308 12 2	
2. Profit and loss account—			3. Coke and breeze—ditto	4,422 5 0	
Balance at credit thereof (Account E)	30,254 2 9		4. Tar and other products—ditto	1,693 14 0	
3. Reserved fund account—			5. Sundry stores—ditto	5,327 12 7	
Balance at credit thereof (Account F)	20,814 0 6				30,752 3 9
4. Depreciation-fund account (for works on leasehold lands)—			6. Gas and meter rental—balance of this account due to the company, less deposits and prepayments	71,927 17 5	
Balance at credit thereof (Account G)	1,000 0 0		7. Coke and other residuals—balance of these accounts due to the company	17,096 14 5	
5. Unpaid dividends	3,658 12 8		8. Sundry accounts	532 19 6	
6. Interest accrued and unpaid on bonds and other loans	1,690 8 0				89,557 11 4
7. Sundry tradesmen and others, for amount due for coals, stores, &c.	57,709 4 6		9. Redemption-fund		268 19 6
			10. Investment account		20,814 0 6
	£153,946 14 2				£153,946 14 2

The GOVERNOR said it now became his duty to move that the report be adopted, and in doing so he would remark that the balance-sheet was made out in the form required by the Board of Trade, and he believed it conveyed to the shareholders every particular requisite for them to be acquainted with so as to be informed of the exact position of the affairs of the company. He was sure the shareholders were all aware that the directors of this company, in common with the directors of every other gas company in England, had been in great anxiety during the past year in reference to the price of coals, and that in some cases much difficulty had arisen from the extraordinary rise in the cost of that material. The Chartered and Imperial Companies had found themselves under the necessity of applying to the Board of Trade for a revision, and had obtained power to increase the price of gas The directors of the London Company had taken the best precautions they could to keep the price of gas down as low as possible; they had gone to the best markets for the supply of the coal they required, and he was happy to state that as the result of their labours they had been enabled, without making any extraordinary demand upon the consumers of gas, to pay the usual dividend to their shareholders—the highest rate, in fact, allowed by the law. Under such circumstances, he thought the report must be very satisfactory to the meeting. The details of it he need not go into, because all that could be said on any point was clearly set forth in the accompanying accounts. It would be observed that the increased business of the company had rendered advisable an enlargement of the works. This enlargement was in course of completion, and it was to meet the necessary outlay that a call was made upon the A shares, payable on the 31st ult., which call had been met with great regularity. He was not aware that he need call attention to any other matter, but if shareholders desired further information he should be happy to give it.

Mr. M. R. HAWKINS (deputy-governor) seconded the motion.

Mr. FORD said a year ago the directors sent out circulars to the shareholders, asking whether the 6 per cent. preference holders would be prepared to pay up the amount remaining uncalled on their shares, and be content to receive 5 per cent. thereon until the call was actually made. He presumed that those who did make such advances would be credited with the amounts paid as part payment of their calls.

The GOVERNOR said they would, and they would be entitled to 6 per cent. dividend from the 31st ult.

Mr. FORD expressed himself satisfied with the report and accounts, but suggested that for the future the accountant should set out in detail in the profit and loss account the amount of dividend paid to each class of shareholders, instead of giving the whole in a lump sum.

The GOVERNOR said the accounts were made out in the form prescribed by the Board of Trade, and as 6 per cent. was the rate of preference and 10 per cent. the ordinary rate of dividend, it was a very simple matter to calculate the sums paid on the several classes of shares. Of course, any information desired by the shareholders could be readily obtained at the office.

The motion was then put, and carried unanimously.

The GOVERNOR moved, and Mr. HAWKINS seconded—"That the following dividends be declared—viz., the fixed dividends on all classes of preference stocks and shares, and also a dividend at the rate of 10 per cent. per annum on the ordinary stock for the half year ending Dec. 31 last., payable on the 15th inst."

The motion was put and carried, and the retiring directors and auditor were severally re-elected.

Mr. Jonathan Denny was also elected an auditor in the room of Mr. Miley, who had been appointed to a seat at the board, vacant by the retirement of Mr. Christie.

A vote of thanks was then given to the governor, deputy-governor, and directors, for their continued attention to the affairs of the company.

The GOVERNOR, in acknowledging the vote, said he felt exceedingly obliged, as did also his brother directors, for the confidence which the shareholders continued to place in them. When he joined the board in 1847 the company were in great trouble. He had been watching the progress of the undertaking ever since, though not a director during the entire interval, and was gratified to witness its increasing prosperity. He concurred in a remark which had been made as to the election of Mr. Miley to the board; the only regret he felt in connexion with the appointment being that they thus lost the valuable services of that gentleman in the auditing of the accounts. He believed, however, that in the appointment of his successor there would be no falling off in the care and attention which had hitherto been devoted to this department.

A vote of thanks was given to Mr. Dove, the secretary, on the motion of a SHAREHOLDER, seconded by the Hon. ARTHUR KINNAIRD, M.P., and Mr. DOVE having responded,

Mr. FORD moved a vote of thanks to Mr. Morton and the officers of the company.

Mr. RAWLINGSON seconded the motion, and spoke in high terms of the service rendered by the engineer during the recent high tides in the Thames, which he believed had saved the company from a great catastrophe.

The Hon. ARTHUR KINNAIRD said he was sure it would be gratifying to the shareholders to know that, under the advice of Mr. Morton, the directors had distributed a quantity of coke amongst the poor people immediately surrounding the works at Nine Elms, whose houses had been submerged by the heavy tides just referred to. This timely distribution had been attended with most beneficial results.

The motion was cordially adopted.

Mr. MORTON acknowledged the compliment, and said a vote of this kind was a great encouragement to him, as he was sure it would be to the other officers of the company, in the discharge of their duties.

CADIZ WATER-WORKS COMPANY.—The second ordinary general meeting of the shareholders of this company was held at the City Terminns Hotel, Cannon Street, on the 31st ult.—Mr. William Hawes in the chair. The report stated that the operations of the company since the last meeting fully confirmed the expectations then held out to the shareholders as to the remunerative character of the undertaking. It was then anticipated that the works would have been finished early in this year; but, from unforeseen circumstances, they would not be ready for opening till the end of May. With respect to the supply of, and demand for, the water, and the probable revenue to the company, the collecting works were yielding already an enormous body of water, and up to the beginning of February no rain had fallen at Cadiz since the beginning of April last. The works were all proceeding satisfactorily.

SURREY CONSUMERS GAS COMPANY.

The Ordinary Half-Yearly General Meeting of Shareholders was held at the Terminus Hotel, London Bridge, on Wednesday, April 8—BENJAMIN DUVAL, Esq., in the chair.

The SECRETARY (Mr. W. P. Boddy) read the notice convening the meeting, and the following report and statements of account were presented:—

The directors present to the shareholders, the subjoined balance-sheet and accounts of the company for the half year ending Dec. 31, 1873.

Dr. *Revenue Account, for the Half Year ended Dec. 31, 1873.* *Cr.*

To Manufacture of gas—					By sale of gas—			
Coals, including dues, carriage, unloading, and all expenses of depositing same on works	£32,862	10	3		Common gas, at 4s. 6d. per 1000 cubic feet	£35,840	4	3
Purifying materials, oil, water, and sundries at works	351	5	4		Public lighting and contracts	6,712	13	11
Salaries of engineer and officers at works	520	0	0					£42,552 18 2
Wages at works	4,102	3	10		Residual products—			
Repair and maintenance of works and plant (including renewal of retorts), machines, apparatus, tools, materials, labour, &c.	5,689	18	7		Coke, less labour and cartage	14,411	17	4
	£43,615	18	0		Breeze	172	3	3
Less old materials sold	46	0	0		Tar	1,986	5	1
			£43,569 18 0		Liquor	350	0	0
Distribution of gas—								16,920 5 8
Salaries of inspector and clerks in Light Office	245	9	4		Rents			480 2 0
Repair, maintenance, and renewal of mains and of service-pipes, including materials, laying and paving, and labour	2,744	7	3		Transfer fees			4 15 0
Repairing, renewing, and refixing meters	279	2	11		Rental of meters			1,088 5 11
			3,268 10 6					
Public lamps—								
Lighting and repairing			720 4 0					
Rents, rates, and taxes—								
Rents	99	5	2					
Rates and taxes	1,331	12	9					
			1,430 17 11					
Management—								
Directors allowances	750	0	0					
Salaries of secretary, accountant, office-keeper, and messenger	499	8	0					
Collectors commission and salaries	389	3	11					
Stationery and printing	113	18	8					
General establishment charges	282	4	1					
Auditors	42	0	0					
			2,076 14 8					
Bad debts			293 19 9					
Discounts			113 4 2					
Total expenditure			£51,473 18 0					
Balance carried to profit and loss account			9,572 8 9					
			£61,046 6 9		Total receipts			£61,046 6 9

Dr. *Capital Account, for the Half Year ended Dec. 31, 1873.* *Cr.*

	Expenditure to June 30, 1873.	Expended this Half Year.	Total to Dec. 31, 1873.		Certified Receipts.	Received during Half Year.	Total Receipts to Dec. 31, 1873.
To Expenditure	£288,165 16 5	£1,182 0 0	£289,347 16 5	By Ordinary shares of £10 each	£150,000 0 0	..	£150,000 0 0
				Ditto shares of £10 each, £7 paid	70,000 0 0	..	70,000 0 0
				Mortgages and bonds	59,660 0 0	£340 0 0	60,000 0 0
				Calls paid in advance	..	3,233 0 0	3,233 0 0
				Balance			6,114 16 5
			£289,347 16 5				£289,347 16 5

Dr. *Profit and Loss Account, for the Half Year ended Dec. 31, 1873.* *Cr.*

To Interest on mortgages and bonds, to Dec. 31, 1873			£1,714 7 11	By Balance of net profit brought from last account	£19,071	13	7	
Balance of net profit to be carried to next account, subject to half year's dividends, to Dec. 31, 1873			15,929 14 5	Less dividend paid for the half year ended June 30, 1873	11,000	0	0	
							£3,071 13 7	
				Balance brought from Revenue Account, being profit for half year to Dec. 31, 1873			9,572 8 9	
			£17,644 2 4					£17,644 2 4

Dr. *General Balance-Sheet, Dec. 31, 1873.* *Cr.*

To Profit and Loss Account—				By Cash at bankers				£8,726 5 7
Balance of credit thereof			£15,929 14 5	Coals, for stock on hand, Dec. 31, 1873				5,318 15 0
Unpaid dividends			143 9 6	Gas-rental—				
Sundry tradesmen and others, for amount due for coals, stores, &c., to Dec. 31, 1873			34,809 11 11	Balance of this account due to the company on Dec. 31, 1873, less deposits and prepayments				28,411 3 9
Depreciation-fund			1,800 0 0	Coke and other residuals				3,624 4 11
				Sundry accounts				435 10 11
				Cash in office				51 19 3
				Balance of capital account				6,114 16 5
			£52,682 15 10					£52,682 15 10

The net profit for the half year, after payment of interest upon the debenture bonds is £7858 0s. 10d., to which is added £8071 13s. 7d. brought from the last account, producing together a net balance of £15,929 14s. 5d.

The directors recommend the payment of a dividend of 5 per cent. for the half year, which will absorb £11,000, and leave a balance of £4929 14s. 5d. to be carried to the next account.

The directors retiring by rotation are Henry Blake, Esq., and Colonel Beresford, M.P., who, being eligible, offer themselves for re-election.

William Westcott, Esq., the auditor, also retires, and, being eligible, offers himself for re-election.

The CHAIRMAN said he was rather pleased to see so small an attendance, as it indicated that the shareholders were pretty well satisfied that their affairs were in good hands, and were progressing satisfactorily. He was happy to say that, under all circumstances, such was in reality the case. No doubt the directors had had a great deal to contend with during the last year or two in the difficulties arising out of the state of the coal market, with other things, and the balance-sheet now presented did not show such good results as they could wish, inasmuch as they had to take a sum from the balance of former profits to make up the half year's dividend. But after all he felt that they might congratulate themselves on looking round upon their neighbours, especially in the great lighting districts, and making comparisons between their respective positions. One company had had to take something like £41,000 from their reserve, and another nearly £10,000, to make up their dividends, whereas this company had only to draw about £3000 or £4000—a very small amount by comparison with others. And with regard to the general conduct of their business, he did not believe there was another company in London who made gas cheaper and better than the Surrey Consumers. There were complaints occasionally out of doors, but these did not emanate from the consumers, but from a small body of agitators who found their account in endeavouring to create dissatisfaction. The directors had had people waiting upon them and asking for a reduction in the price of gas. How was it possible, when they had to take £3000 from the balance of profits to make up the dividend? They had a right to look to their shareholders, and that they would certainly do; they were bound also to look to their works, and keep them in a state of efficiency; at the same time, they hoped it would not be long before they would be able to make a reduction in the price of gas, and no one would be more pleased in such an event than the directors. After again referring to the position of some other London companies, and calling attention to the recent proceedings before the Board of Trade Commission, on the applications of the Chartered and Imperial Companies for a revision of price, the chairman concluded by moving the adoption of the report.

Mr. NICHOLSON seconded the motion.

Colonel WILBRAHAM asked the reason why the returns for ammoniacal liquor were so small in this company, as compared with others.

Mr. FINLAY, the engineer, said the price obtained for liquor by this company was very small as compared with other metropolitan companies; there was no disguising the fact, and it would be readily seen how this was brought about. For the last four or five, or, he might say, seven years, it had been supposed that an amalgamation would be brought about between the South London Companies. The directors of this company from time to time, when the question of extensions and purchase of land was brought before them, felt that under the circumstances their decision should be deferred. The consequence was, that when the amalgamation scheme failed, they were compelled at once to purchase land and erect new plant. Up to that period the company had really no room to erect the necessary machinery to carry on the works as they should be, and when he mentioned the fact that during the last winter he had every retort in action, the shareholders would see at once the limitation that was put upon him. If there had been any failure, he must have gone to other companies for assistance, or have crippled the supply. The directors had purchased land now, and he was now erecting new scrubbers. The company were under contract for their liquor for some time to come. When that contract was out, in June, 1875, the accounts in this respect would show a great change.

The motion for the adoption of the report was put and carried.

The CHAIRMAN moved—"That a dividend of 5 per cent., for the half year ending Dec. 31 last, be declared and made payable on and after the 13th inst." The motion was adopted, and the retiring directors and auditor were re-elected.

Col. BERESFORD, M.P., returned thanks on his own account, and Mr. JAMES returned thanks for Mr. Blake, who was absent through indisposition.

Mr. POWELL moved a vote of thanks to the directors, engineer, and secretary.

Mr. BRICKHILL seconded the motion, and, referring to an observation made by the chairman, said he thought the directors ought to be modest in their remarks about agitators, seeing that the Surrey Consumers Company was founded on agitation.

Mr. WHITE, in supporting the motion, said he should advise any shareholder who wanted to know how the business of the company was carried on, to pay a visit to the works. He had done so himself, and received the utmost courtesy from the engineer. He was surprised to find what results could be accomplished in the limited space at their disposal, and it gave him the greatest satisfaction to see the way in which their affairs were conducted.

The motion was put and carried, and the CHAIRMAN having acknowledged the same, the proceedings terminated.

ODESSA WATER-WORKS COMPANY, LIMITED.

The Third Ordinary General Meeting of this Company was held on Tuesday, the 31st ult., at the City Terminus Hotel, Cannon Street—Mr. ARTHUR TEMPLE FELIX CLAY in the chair—when the following report was presented:—

The directors submit a statement of receipts and expenditure from the commencement of the company to the close of the year 1873.

Water was delivered in the town of Odessa on the 30th day of November, and the works were formally opened by the Russian authorities on the 3rd day of December, 1873, on which day the supply commenced, and from which date the number of public and private consumers has continued steadily to increase, and as far as can be ascertained from the returns already received, the revenue will fully equal the anticipations of the directors expressed in their last year's report.

Two of the directors, Mr. Robert Barclay and Sir William D. Clay, Bart., retire at this meeting by rotation. They are eligible for re-election, and offer themselves accordingly.

The auditors, Mr. Ernest Oswald Coe and Messrs. Robert Fletcher and Co., also offer themselves for re-election.

Capital Account, Dec. 31, 1873.

Dr.				*Cr.*			
Purchase of concession	£80,000	0	0	A Shares Preferred—			
Payments to contractors for works	704,781	18	10	30,000 shares of £20 each, 30,000 shares issued	£600,000	0	0
Payments to engineers	33,565	7	5	B Shares Deferred—			
Extra machinery and plant	971	0	0	12,500 shares of £20 each, 11,394 shares issued, fully paid	227,880	0	0
Expenditure at Odessa for capital purposes	7,663	3	1	1,106 shares unissued.			
Directors fees, salaries, rent, taxes, and office expenses in London	4,623	18	7	12,500			
	£831,605	7	11				
Less interest received on deposits with bank and calls overdue	10,072	10	1				
	£821,532	17	10				
Balance to general balance-sheet	6,347	2	2				
	£827,880	0	0		£827,880	0	0

General Balance-Sheet, Dec. 31, 1873.

Cash at London and Westminster Bank—				Balance from capital account	£6,347	2	2
On deposit	£7,000	0	0	Bills payable	25,065	10	10
On current account	2,306	14	6	Debts due by the company	9,752	16	6
Cash at Odessa	522	9	8				
	9,829	4	2				
Caution money deposited under terms of concession	27,417	15	5				
Stock at Odessa, and revenue charges paid in advance	2,801	10	4				
Purchase of office lease in London, and office furniture	1,116	19	7				
	£41,165	9	6		£41,165	9	6

The CHAIRMAN, in moving the adoption of the report, said the past year, he could assure the meeting, had been a period of anxiety and of hard work, for the directors and the officers of the company. They had used the most strenuous efforts to get the whole of the works completed by the date specified in the concession, which was the 29th of September last. As a matter of fact, the water was delivered in the city of Odessa on the 30th of November, which was rather less than two months beyond the appointed time, but in reality they were three months in advance of it. By the terms of the concession they were allowed two clear years, and that was little time enough for the completion of such a gigantic work as that on which they were engaged. The works were to have commenced in April, 1871, and to have been completed in April, 1873, but the municipality of Odessa delayed the approval of the plans for five months, and in consequence of that the time for the completion of the works did not begin to run until September, 1871. The consequence of that delay was, that as the heavy works could not be taken in hand in the winter months, they had to wait until the following spring before active operations could be commenced, so that they only had 19 months instead of 24 for the execution of the undertaking, and they had completed it in 21 months. As mentioned in the report, the works were formally opened on the 23rd of December last, when the public were admitted within the area of the company's premises, and the excitement was so great that many of the bystanders dipped their hats into the water and handed it round to be tasted by the crowd, and one gentleman was so excited that actually he threw himself into the water—and that, be it remembered, in the month of December, when a cold bath has rather a depressing effect. The directors had had some of the water sent over to this country in sealed bottles, in order to have it analyzed, and the result of the analyses showed that it was very much the same as Thames water, which was considered the best in the world, with the exception that it was less hard, and contained no trace of organic matter. Mr. Quick, in a letter to the board, dated the 11th of March, stated that the delivery was made at the full pressure under the terms of the concession, that the house service was almost completed, that they were going to have 21 cattle-troughs, instead of 19, of which all but 7 were finished; that they had made 50 street-wells, and were about to make 50 more, but that the town works had not been as yet commenced. The reason why the town works had not been completed was that the site originally chosen for them was a place called the Pishburgh, and an objection was raised to that site, as it was the place where a great number of persons had been buried at the time of the plague, and it was feared it might deleteriously affect the water. That delayed them some time, but finally it was decided that the site in question was as good a one as they could find. In addition to that they found that the work was not of the best character, and therefore the plans had to be altered, and it was only the other day that the Duma gave their formal approval of them. Those works were therefore being now proceeded with, but their non-completion had had no effect whatever on the delivery of the water. The shareholders would see from what he (the chairman) had just stated that in all essential points the works were now completed. The main point was that the municipality of Odessa should appoint some members of their own body to test the works, so as to see that in their power and capacity they complied with the terms of the concession. That had been done, and the result was, that it was found that the pressure was even greater than had been required, and, therefore, the gentlemen in question were perfectly satisfied with what they saw. As a matter of course, in an undertaking of that kind, absolute completion by a specified time was impossible. So long as they continued there would be alterations and improvements required; but he might say that the works had been completed, so far as the terms of the concession were concerned, when the water was delivered to the citizens of Odessa; but the municipality of that city, to whom such works were novel, seemed to have been of an opinion that such was not the case until every screw and bolt was driven home and in their proper positions; and holding that opinion, they continued to send the directors notice that they considered the works were still incomplete. That being so, the members of the board thought the matter should be placed in its proper light before the municipality, and with that view they commissioned Messrs. Blunt and Quick to wait upon that body to do so. Those gentlemen had accordingly acted upon their instructions, and that, too, with the most complete and satisfactory result. The immediate effect of their interview with the municipality was the withdrawal of the last protest they had been about to forward to the board. By this withdrawal they in effect admitted the completion of the works, and the whole thing now resolved itself into an amicable arrangement. Negotiations were, he was happy to say, proceeding satisfactorily, and were reduced to the arrangement of terms for domestic supply without meter, which was a mere matter of detail, and the result would be very favourable to the company. He had just received a telegram from Mr. Blunt, in which that gentleman stated that on general terms an understanding had been arrived at, but that the Duma required some time for further considering it, and that, although he would the next day leave Odessa for Constantinople, Mr. Quick would remain there a few days longer. He added that contracts and demands for a supply of water increased rapidly, and that all else was well. With regard to any penalties which might be asked for in consequence of the non-completion of the works within the specified time, the directors were in a position to prove that the delay was entirely the fault of the municipality, and that they alone were responsible for it, but now there would be no question of the sort, inasmuch as the whole matter had been amicably arranged. It was that he might have the latest news in respect to these points that the directors had ventured to put off the holding of the meeting to that day. Another matter on which they might fairly congratulate themselves was, that all the works had been soundly and admirably carried out. Nothing had been neglected. In fact, all the materials, as well as the workmanship, were of the best possible character, and that would tell favourably in the future expenditure on repairs and maintenance. The original estimate would be exceeded only by a very small amount—about 2 or 3 per cent. upon the capital, and that he considered was by no means an unsatisfactory result, but they could not have helped to hope for such success. A certain amount had been put aside to provide for a house service, calculated on a certain number of persons inhabiting each, according to the data which had been supplied to them, but that calculation of the supply which would be required turned out to be absurdly inadequate. In order to furnish all that was wanted they would require more capital, but it was a capital which would bring in a most remunerative return. What they proposed to do was this. Under the Articles of Association they had power to issue £200,000 debentures, and they now intended to exercise that power to the extent of £50,000 at 6 per cent. They would not require more for some time to come. They had delayed taking that step until after the holding of the present meeting, that they might have the opportunity of explaining to the shareholders more explicitly the reasons why they were about to do so. In the issue, as a matter of course, preference would be given to the existing shareholders, who would find it an excellent investment. He had now to refer to the question of revenue. They would recollect that last year he had ventured, after great hesitation, and after having convinced himself of the truth of what he was about to state, that the revenue would amount to £100,000 a year. He was happy to be now in a position not only to repeat that statement, but also to say that it was greatly under the mark.

A SHAREHOLDER: Do you mean gross or net?

The CHAIRMAN said he meant that the gross revenue would exceed that amount. He ought, however, to say that the estimate, although based on what had been already the actual receipts, was only conjectural, but still the directors had satisfied themselves so thoroughly on that point, that he had no hesitation whatever in making the statement he had done, nor in adding that, notwithstanding the many interruptions to which the service had been exposed, they would collect two-thirds of that amount in September next. In conclusion, he had only to add that the success of carrying out the works was mainly due to the energy and ability of the engineers, and to the hearty goodwill with which they worked, having but one object in view, and that the success of the company.

Mr. ROBERT BARCLAY seconded the motion.

A SHAREHOLDER inquired, with respect to the 1106 shares unissued, if they were to be handed over to the contractors as part payment of the contract, and whether the directors intended to continue to hold annual meetings, or to have a meeting every six months.

Another SHAREHOLDER asked whether, in the event of the municipality of Odessa giving a formal acknowledgment that the works had been carried out and completed in the terms of the concession, the directors would take care that the shareholders were informed of that fact.

A third SHAREHOLDER asked whether or not the directors contemplated being able, out of the net profits, to pay a dividend on the A and B shares all round.

Mr. SAMUDA, M.P., hoped the chairman would give the meeting some explanation with respect to what was likely to be the amount of the working expenses for earning the £100,000 he had mentioned, so that the shareholders might be able to form some idea whether or not their prospects were likely to be better than those mentioned in the original prospectus. He had another question to put with respect to a report which he hoped the chairman would be able to contradict. It was a report which had reached him from Russia, to the effect that considerable interruption had taken place in consequence of the imperfect laying of the pipes, or of some imperfection in the strength of the pipes themselves, and that this defect in the original construction had conduced to an increased cost in carrying out the contract. He had obtained his information from one of the first merchants in Odessa, who had informed him that this circumstance had occasioned great disappointment in that city. The next point on which he desired some information was this. It appeared from the capital account that £821,532 had been already expended, and he gathered from what had fallen from the chairman that that amount was only from 2 to 3 per cent. in excess of the original estimate, and, therefore, he should feel obliged to him if he would now state what was the amount of the original estimate. Again, according to the terms of the concession, it appeared that the delivery was to be 5400 gallons daily, and it appeared that that had been carried out; but the prospectus stated that that supply would yield a net return to the company of £46,000 per annum, which was guaranteed, and he now wished to know whether the rates would produce that £45,000 net; and again, whether the increased capital was required in order to secure a supply over and beyond what had been originally contemplated.

The CHAIRMAN said he would reply to the questions put to him by the last speaker first. As regards the working expenses, according to the best estimate the directors could form of them, they would this year amount to about £20,000, and in subsequent years to about £24,000 per annum. The honourable gentleman's second question related to the interruption of the service, of which he had received particular accounts from Odessa; and on that point he could assure him that the interruptions referred to were not in any way to be attributed either to any defect in the laying of the pipes, or to any defects in the strength of the pipes themselves. Every one who had any acquaintance with hydraulic engineering knew that when mains were tested for the first time they were likely to burst, and that was a thing which they might have expected in regard to their mains, which were 27 miles long. When water was first admitted into the mains, some air was sure to get imprisoned, and the consequence of that was that the water swayed backward and forward, until it at length blew up; but when the mains became what was technically known as seasoned, all danger of that kind entirely disappeared. It was so with respect to their mains, which were now in perfect working order. The bursting of the mains which had unfortunately taken place frightened the people of Odessa, who had not been aware of this fact, nearly out of their wits. The original estimate would cover the whole of the expense of laying the pipes, which were capable of supplying the whole 5400 gallons required. There had been already expended £850,000, and £30,000 more was to be paid, and they would, when completed, be

able to supply the full quantity required. The honourable gentleman next asked if the present rates would realize the amount of the guarantee, £45,000. If they only assumed that the water which was to be supplied would be paid for, they would, at the very least, realize £150,000 per annum. Then as to the new capital, it was for a new supply not contemplated in the original estimate. As regards the dividend, which would be based upon the net profits, it would be declared out of those for the first seven months, and that would be in October. Another gentleman had asked a question with respect to the unissued shares. These were shares which were to be taken by the contractors in part payment of the works they had executed. These were the unissued B shares. The whole of the A shares had been issued and paid up. He had been asked another question, which was, whether, when they obtained the formal recognition of the completion of the works from the municipality of Odessa, the fact would be communicated to the shareholders. He considered that that recognition had been already obtained, but if not it would be, and then the shareholders should be informed of it. Then he had been asked whether the net profits would be sufficient to pay a dividend on both the A and the B shares. As the shareholders were aware, the B shares took nothing until 6 per cent. had been paid on the A shares; but after that the directors would pay on both classes alike, and he was happy to say that it was likely they would in the first year realize an amount of net profits in excess of that required to pay a dividend on both. As regards the six-monthly meeting, the directors felt they were entirely in the hands of the shareholders; and whatever might be their wish, they would most willingly carry out. The Articles of Association provided for only one meeting in the year, to be held in the month of March; but if the shareholders expressed a wish in favour of holding the meetings half yearly, there would be no opposition to it whatever on the part of the board. All they had to consider was how it could be carried out without an alteration in the Articles of Association. It was, however, competent for the meeting to decide when the next meeting should be held, and they might come to a resolution that a meeting should be held in October next.

The motion for the adoption of the report was then unanimously agreed to.

After some conversation with respect to the best means of providing for the half-yearly meeting, it was at last resolved that the next meeting of the company should take place on some day in the month of October, to be selected by the members of the board; and one shareholder handed in a notice to the effect that he would at the next meeting move a formal resolution providing for the holding of half-yearly meetings, it being understood that the directors shall only be required to furnish a balance-sheet on the occasion of the March meeting.

The retiring directors and auditors were then re-elected, and the proceedings closed with a cordial vote of thanks to the shareholders.

CITY OF LONDON GAS ACT, 1868.

BOARD OF TRADE COMMISSION.

Memorandum of the Commissioners appointed by the Board of Trade on an application of the Chartered (Gaslight and Coke) Company for a Revision of the Illuminating Power and Price of Gas supplied by them for 1874 *referring to the Certificate of the Commissioners of this date.*

1. On the 13th of July, 1868, two Acts of Parliament were passed, affecting the Chartered (Gaslight and Coke) Company; (1) the City of London Gas Act, 1868; (2) the Gaslight and Coke (that is, the Chartered) Company's Act 1868.

2. At that time the City was supplied with gas by three companies—(1) the Chartered Company, (2) the City of London Gaslight and Coke Company, and (3) the Great Central Gas Consumers Company. The last-named two companies were afterwards amalgamated with the Chartered Company, and the City thereupon came to be supplied, as it now is, by the Chartered Company alone. The Chartered Company have always supplied, as they now supply, gas in a large district outside the City.

3. The first of the two Acts before mentioned (namely) the City of London, Gas Act, 1868, is an Act amending the Metropolis Gas Act, 1860, as regards the City of London. It is referred to in this memorandum as the City Gas Act, 1868.

4. The City Gas Act, 1868, provides (among other things) to the effect (sections 53, 54, and 56) that, subject to the other provisions of that Act, on and after the 1st of January, 1870, the gas (except cannel gas) supplied by each company affected by the Act shall be of an illuminating power of not less than 16 candles, and the maximum price for 16-candle gas shall be 3s. 9d. per 1000 cubic feet, and for cannel gas shall be proportional to that price.

5. The City Gas Act, 1868, further provides (section 57) to the effect that, if in January, 1871, or any subsequent year, application is made to the Board of Trade by any company affected by the Act for a revision of the scale of illuminating power and price, the Board of Trade shall appoint commissioners for that purpose; and (section 66) that the commissioners, after hearing the company and the Corporation of the City of London, if desiring to be heard, shall fix an illuminating power and price for the company, to take effect as on and from the 1st of January in the year of revision.

6. The City Gas Act, 1868, further enacts (section 68) as follows:—

Rules for fixing Power and Price.

68. In fixing the illuminating power and price for any company for any year, the commissioners shall observe the following rules:—

(1.) They shall fix such an illuminating power and such a price as shall be calculated to yield to the company, with due care and management, a dividend in that year (after allowing for the excess or surplus, if any, carried in the then last preceding year to the credit of the divisible profit and to the insurance-fund of the company) attaining as near as may be, but in no case exceeding, the rate of ten pounds per centum per annum, and to make up the insurance-fund authorized by this Act to be made up;

(2.) They shall take into account any saving or economy which they shall be of opinion might have been effected by amalgamation of the companies or any of them;

(3.) They shall not fix, in any case, an illuminating power lower or a price higher than the minimum of illuminating power and maximum of price prescribed by the Act of 1860;

(4.) Subject to the foregoing provisions, they shall fix the illuminating power as high and the price as low as circumstances admit.

7. The City Gas Act, 1868, contains also the following sections (25 to 28), to which section 68 is closely related:—

Profits of Company limited.

25. The profits of each company to be divided among the shareholders in any year shall not exceed the rate of ten pounds per centum per annum on the share capital of the company authorized by Parliament and paid up and expended on the undertaking.

If Profits exceed the amount limited, Excess to be invested, and form an Insurance-fund.

26. If the clear profits of the undertaking in any year amount to a larger sum than is sufficient to make a dividend of ten pounds per centum, the excess beyond the sum necessary for such purpose shall from time to time, to the extent of one pound per centum per annum upon the paid-up capital of the company, be invested in Government or other securities; and the dividends and interest arising from such securities shall also be invested in the same or like securities, in order that the same may accumulate at compound interest, until the fund so formed amounts to a sum equal to one-twentieth of the paid-up capital of the companies, which sum shall form an insurance-fund, to meet any extraordinary claim or demand which may at any time arise against the companies from accident which due prudence and management could not have prevented; and if such fund be at any time reduced, it may hereafter be again made up to the same sum, and so from time to time as often as such reduction shall happen: Provided, that when and as often as the said fund shall reach one-twentieth part of the paid-up capital, the interest thereon shall be carried to the credit of the fund available for dividend.

Application of Excess of Profits over 10 *per cent.*

27. If the clear profits of the undertaking of a company in any year amount to a larger sum than is sufficient to make a dividend at the rate of ten pounds per centum per annum, and to form or make up the insurance-fund by this Act authorized, the excess shall be carried to the credit of the divisible profits of the undertaking for the next following year.

Provision for lower Rate under special Act.

28. With respect to any portion of the capital of any company on which a rate of dividend other than ten pounds per centum per annum is allowed by any special Act of the company, the provisions of this Act shall be read and have effect as if such other rate of dividend had been therein mentioned, instead of the rate of ten pounds per centum per annum.

8. The second of the two Acts of July 13, 1868, before mentioned—namely, The Gaslight and Coke (that is, the Chartered) Company's Act, 1868, is an Act consolidating the Chartered Company's Acts and amending them generally with reference to the company's whole undertaking. It contains a provision (section 109) to the effect that if the bill for the City Gas Act, 1868, passed into law in the then session (as it did), then the company and their undertaking should be subject to the provisions of the City Gas Act, 1868, without as well as within the City, and the City Gas Act, 1868, should extend to the whole undertaking of the company, the Metropolitan Board of Works being substituted for the Corporation of the City in relation to the undertaking of the company outside the City.

9. It would seem to have been the intention of the Legislature, by the two Acts of 1868 taken together, to put the Chartered Company under the same statutory regulations in relation to their whole undertaking, and throughout their whole district, outside as well as inside the City. A question, however, arose whether this intention had been effected; and it was decided by the Courts of Queen's Bench and Exchequer Chamber, on the construction of the Chartered Company's Act of 1868, that the company still remained subject to the Metropolis Gas Act, 1860, as regarded their undertaking and district outside the City, in some respects in which they were relieved from that Act as regarded the City. This difference appears to have been effectually put an end to by an Act obtained by the company in 1873.

10. In January, 1873, application was made to the Board of Trade by the company for a revision of the scale of illuminating power and price of their gas; and thereupon the Board of Trade appointed us to be commissioners for that purpose.

11. By a certificate, dated April 25, 1873, we fixed for the company, as regards common gas, the illuminating power at 16 candles, and the price at 4s. 4d. for 1000 cubic feet, and, as regards cannel gas, the price at 6s. 3d. for 1000 cubic feet for 23-candle gas.

12. By a memorandum of even date therewith we gave reasons for the prices fixed by the certificate.

13. Under the Acts of Parliament a revision operates only till the end of the year. The prices fixed by us ceased to be chargeable at the end of 1873; and thereupon (subject to the effect of a further revision, if any) the maximum prices became again the prices fixed by the City Gas Act, 1868, as described in paragraph 4 of this memorandum.

14. On Jan. 1, 1874, application was again made to the Board of Trade by the company for a revision of the scale of illuminating power and price of their gas; and thereupon the Board of Trade appointed us to be commissioners for that purpose.

15. We proceeded to hear the company, and the Corporation of the City, and the Metropolitan Board of Works, by their respective counsel, agents, and witnesses.

16. It appeared that in 1873 the company had met the charge for interest and dividend on loan and share capital in full, but had carried nothing to the insurance-fund.

17. The actual charge for interest and dividend on capital had exceeded the amount allowed for by us by a sum of £11,189, made up as follows:—

Interest on temporary loans	£509
Interest on share capital paid in anticipation of calls	3,573
Dividend on share capital issued in 1873	7,543
	£11,625
From which a deduction is to be made for less interest paid on debentures	436
Leaving the total	£11,189

18. The company had also expended for defalcation £5000, and for the stokers strike £5024, which amounts had not been allowed for by us, for reasons given in our memorandum of 1873.

19. The deficiency of net income, not calculated by us to be covered by the increase of price, was £4018. The actual net income had fallen short of our estimate by £3584; one cause being that the increase of sale of gas did not come up to the estimate of the company, which we had accepted.

20. The five last-mentioned items had absorbed nearly the whole of the amount allowed by us for the insurance-fund, £29,024; and, after paying the interest on loan capital, and the dividends allowed by the Acts of Parliament on share capital, the company had in hand at the end of 1873 a surplus of £209 0s. 6d., and no more.

21. None of the parties proposed a reduction of the illuminating power of common gas below 16 candles.

22. By arrangement between the company and the Metropolitan Board of Works, representing the consumers (as regards cannel gas), the company had discontinued the supply of 23-candle gas from the end of June, 1873, and had substituted 20-candle gas.

23. We have, therefore, by our certificate of this date, fixed for the company the illuminating power of common gas at 16 candles; and we take that of cannel gas at 20 candles, which is the minimum power allowed for cannal gas by the Metropolis Gas Act, 1860.

24. We have, by our certificate, fixed for the company, for the whole of the year 1874, the price of 16-candle gas at 5s., and that of 20-candle gas at 6s. 3d., for 1000 cubic feet.

25. In the course of our inquiry many questions have arisen bearing more or less directly on the prices to be fixed.

A.—*Loan Capital.*

26. The loan capital of the company existing on the 31st of December was as follows:

At 4 per cent.	£3,000
At 4½ per cent.	14,450
At 4¼ per cent.	281,795
At 4½ per cent.	300,000
At 5 per cent.	14,255
	£613,500

27. The charge for interest on this amount for 1874 is £28,377.

28. In January, 1874, the company proceeded to raise further loan capital. For this purpose they created debenture stock to the amount of £200,000, bearing interest at 4½ per cent., the interest to accrue from the date on which the money was received, and to be paid half yearly on Jan. 15 and July 15 It was contended for the consumers that, in estimating the charge for interest on loan capital in 1874, we should disregard this debenture stock, as not being capital existing on Dec. 31, 1873. But we are of opinion that we are bound to allow for the interest to accrue due in 1874, on so much of this

debenture stock as is allotted at the date of our certificate. This amount is £167,070. The interest to be paid thereon in 1874 is £6305.

29. This sum, added to the sum of £28,377 before mentioned, makes the total charge for interest on loan capital to be allowed for in 1874 amount to £34,682.

30. It is plainly for the benefit of the consumers that as large a portion as may be of the capital of the company should be raised by borrowing at a rate of interest below the rate of dividend payable on capital raised by shares; but by reason of restrictions imposed by the Legislature, the company are not now in a position to raise by borrowing any further capital that may be required to be expended for the purposes of their undertaking. Before they can exercise to any further extent their borrowing powers, it will be necessary, under the restrictions of their Acts of Parliament, for them to raise further share capital to the extent of £10,000 for every sum of £2500 to be borrowed.

31. With respect to the £200,000 now being raised by debenture stock, the consumers have had an exceptional benefit. The power to borrow this amount came to the Chartered Company from the Western Gaslight Company, which the Chartered Company absorbed. The Western Company, having been a company incorporated and self-regulated under the Companies Act, 1862, were not subjected to the restrictions on borrowing which the Legislature think fit to impose on companies incorporated and regulated by special Acts of Parliament. They had unlimited borrowing powers, and it was not obligatory on them to raise share capital in a fixed ratio to loan capital, and as a condition precedent to borrowing. Under the Western Amalgamation Scheme (paragraph 20) their borrowing powers are to be taken as limited to £200,000, but no other restriction is thereby imposed. Consequently, the Chartered Company, using the borrowing powers transferred to them from the Western Company, have been enabled, to the advantage of the consumers, to raise this additional capital of £200,000 wholly at 4½ per cent., instead of wholly or partly at 10 per cent.

B.—*Share Capital.*

32. In accordance with the view which, after obtaining the opinion of the law officers of the crown, we adopted in the case of the Imperial Gas Company this year, we think that, in considering the question of due care and management, we are precluded by the Acts of Parliament from entertaining questions respecting the mode in which the company in years anterior to 1874 raised or expended capital; we have therefore not entertained questions of that kind.

33. We adhere to the opinion expressed in paragraph 13 of our memorandum of 1873 to the effect that, for the calculation of dividend and insurance-fund, the share capital is to be taken as it stood at the end of the year next before the year of revision.

34. The authorized share capital of the company is £4,150,000 (Western Amalgamation Scheme, section 16). The amount thereof paid up on Dec. 31, 1873, was £3,149,804. We treat the whole of that amount as having been then expended on the undertaking, on the authority of the company's accounts as audited by Mr. Parkes, the auditor appointed by the Board of Trade.

35. Of that capital a portion (£849,826) bears less than 10 per cent. dividend, amounting to £41,500

The residue (£2,299,978) bears 10 per cent. dividend, amounting to 230,000

Therefore the total charge for dividend on share capital to be allowed for in 1874 is £271,500

C.—*Insurance-Fund.*

36. The amount to be allowed for in 1874 for the insurance-fund is £31,500, being 1 per cent. on the share capital paid up on 31 December, 1873.

37. We were strongly urged, for the consumers, to separate in some way the amount which we allow for the insurance-fund, so that it shall be capable of being ear-marked and separately allocated. But we are of opinion that we are not authorized by the Acts of Parliament to do so. Under section 68 of the City Gas Act, 1868, read in conjunction with section 26, we think it is our duty to fix a price calculated to yield such an amount of clear profits of the undertaking as will pay the dividend and leave for the insurance-fund an excess beyond the sum necessary for dividend to the extent of 1 per cent.; but that it is neither our duty, nor within our powers, to attempt to prescribe in what mode those clear profits, if and when realized, are to be actually distributed. That must, we consider, be left to the company, acting under the enactments which regulate the application of their profits.

D.—*Income from Gas.*

38. It is assumed that there will be an increased sale of gas, with a proportionate sale of residuals, in 1874, as compared with 1873. The total quantity of common and cannel gas sold by the company in 1873 was 3,908,326,000 cubic feet. It is to be ascertained what quantity should be taken as the estimated quantity to be sold in 1874.

39. In our inquiry of last year the company gave evidence which led us to estimate the rate of increase for 1873, as compared with 1872, at 7 per cent. on the quantity sold in 1872. The company had over-estimated the rate of increase; the actual rate has been 4·6 per cent. only.

40. This year the company estimate the rate of increase for 1874 below the actual rate of increase in 1873. As they propose to sell common gas instead of cannel gas to the extent of 267 millon cubic feet, they deduct that quantity from the cannel gas to be sold, and carry it to the common gas, with an addition of 10 per cent. for estimated increase of sale, consequent on this substitution of gas of lower power and price. To the remaining quantities of common and cannel gas, taken together, they add 1½ per cent. for increased sale. The aggregate increase thus arrived at is at the rate of 2·1 per cent. on the quantity sold in 1873.

41. It was contended for the consumers that the increase should be estimated at 6 per cent. at least, but we do not think sufficient evidence was adduced to support that view.

42. There is no settled experience on this subject. For many years past disturbing causes have operated in relation to the company, so that no certain inference can be drawn from the company's history. The company's sale of gas in 1873, although exceeding that of 1872 by 4·6 per cent., exceeded that of 1871 by 2·7 per cent. only; that of 1872 having, in consequence, it would seem, of the stokers strike in that year, fallen short of that of 1871 by 1·9 per cent.

43. The rise in price, which results from our inquiry, must, we think, tend to check consumption; bnt to what extent this influence may operate can only be conjectured.

44. We have estimated the increase at 2½ per cent. on the quantity sold in 1873. This is the rate of increase estimated by us in the case of the Imperial Gas Company this year; and, on the balance of conditions, the positions of the two companies seem not dissimilar.

45. The total quantity of gas to be sold in 1874 we therefore take at 4,006,034,000 cubic feet, being, on the principle of the company's distribution (paragraph 40), 3,236,337,000 common gas, and 769,697,000 cannel gas.

E.—*Income from Coke.*

46. Under the important head of coke we accept the company's estimate of income. We are satisfied that by judicious contracts they have secured a good price for the year, as far as the sale depends on contract. Their estimate includes in a proper manner the sum of £18,000 received by them by way of forfeit on cancellation of a contract. An estimate of income from coke sold otherwise than by contract is necessarily uncertain, as the price fluctuates much; for instance, in 1873, the price obtained by the company for best coke, sold retail, varied from 30s. to 12s. a chaldron.

47. We think that the form of the company's published half-yearly accounts would be improved if the receipts for coke were shown in gross, and the expenses of delivery were stated and deducted.

F.—*Expenditure for Coal.*

48. Out of the total quantity of coal required in 1874 (in addition to that in stock on 1st January) to produce the quantity of gas for sale as estimated by the company—namely, 428,201 tons—the company had, at the beginning of 1874, left 74,185 tons only uncontracted for. Having regard to the facts that the price of coal during 1873 was considerably above the average price of the preceding period of seven years, and was continuously falling throughout the year, and to other considerations, we think that, with due care and management, the company would have left a larger proportion of the required coal uncontracted for, and would thereby, in the events which have happened, have saved for the consumers a considerable sum. We accordingly deduct a sum from the company's estimated outlay for coal in 1874; or, in other words, in arriving at the price of gas, we disallow that sum as an outgoing of the company.

49. We also put on the quantity of coal left uncontracted for a somewhat lower price than that estimated by the company.

G.—*Expenditure for Purification.*

50. We have not allowed for the cost of purification of gas the full amount of the company's estimate.

51. The cost of purification being an important outgoing, we think that the company's published half-yearly accounts should give it separately from all other outgoings, distinguishing between cost of material and cost of labour.

H.—*Expenditure for Defalcation.*

52. The scheme for the amalgamation of the Great Central Gas Consumers Company with the Chartered Company, made in pursuance of sections 18 to 24 inclusive of the City Gas Act, 1868, was confirmed by order of the Queen in Council, dated July 6, 1870, and thereupon became as binding as if it had been enacted by Parliament. Sections 22, 23, and 24 of this scheme relate to the defalcation account.

53. Section 22 recites to the effect that in 1869 it was discovered that one of the clerks of the Great Central Gas Consumers Company had abstracted portions of their income amounting to £71,149 6s. 10d.; that, in consequence thereof, that company had abstained from declaring any dividend for three half years ending Dec. 31, 1869; and that it had been ascertained that on that day, after paying the interest on loans, the balance of profit which would have stood to the credit of the company, if the abstraction had not occurred, would have been £56,290 19s. 5d. Section 22 then provides to the effect that the united company (formed by the amalgamation of the Great Central Gas Consumers Company with the Chartered Company) should, out of the last-mentioned sum, forthwith after the confirmation of the scheme, pay to the Great Central Gas Consumers Company £15,000, for division by way of dividend among the shareholders up to Dec. 31, 1869; and that the balance of the said sum of £56,290 19s. 5d., being the sum of £41,290 19s. 5d., should be carried by the united company to the credit of an account to be called the Defalcation Account, and that the united company should place to the debit of the same account the sum of £71,149 6s. 10d., being the full amount of the said defalcation.

54. Sections 23 and 24 of the scheme are as follows:—

United Company to Liquidate Balance of Defalcation Account by Payment of £5000 per Annum.

23. On the 30th day of June and the 31st day of December, 1870, and on the like days of every subsequent year until the said deficit is fully discharged, the united company shall, out of the profits which would otherwise have been available for the payment of a dividend on the ordinary shares of the united company, in the first place and before payment of any such dividend, carry over to the credit of the said defalcation account the sum of not less than £2500, until the entire sum standing to the credit of the same account, including the said balance or sum of £41,290 19s. 5d., shall equal the said defalcation of £71,149 6s. 10d., and the whole of such defalcation shall have been thereby fully discharged; Provided that for the purposes of a revision of the scale of illuminating power and price under the City of London Gas Act, 1868, such half-yearly payments shall be deemed to be payments in respect of dividend.

Balance of Net Revenue to be Applicable to Dividends.

24. In the meantime the half-yearly balance of the net revenue of the united company after carrying over such sum of £2500, or such other sum as may be carried over to the credit of the defalcation account in pursuance of the last preceding section, shall be applicable to the payment of dividends in the same manner as if such defalcation had been fully discharged.

55. In our inquiry of last year the company included in their estimate of expenses for 1873 the sum of £5000 for the defalcation account. In our memorandum (paragraph 20) we said that we disallowed this sum, referring to the proviso to section 23 of the scheme.

56. In our inquiry this year, it appeared that the company had carried £5000 to the defalcation account; and it was contended for the consumers that the effect of this proceeding was to make our disallowance of last year nugatory, and that the sum of £5000, thus carried by the company to the defalcation account in 1873, should be treated as an asset in their hands at the end of 1873. But we think that this contention is untenable, being founded on a misapprehension of the nature of our disallowance last year. We had no power to prevent the company from carrying £5000 to the defalcation account out of their profits, nor did we think of interfering with the operation of the scheme, which expressly directs that they shall carry that sum to the defalcation account. All that we intended to do was, as the proviso to section 23 of the scheme directs, to refuse, in estimating a price calculated to yield the dividend and insurance-fund, to recognize that sum of £5000 as an outgoing of the company having priority to dividend.

57. The sum of £5000 for the defalcation account was therefore a legitimate expense of the company in 1873, having, in fact, priority to dividend; and it cannot be treated as a sum unexpended and remaining in the hands of the company at the end of 1873.

58. In the present year the company, in their estimate of expenditure, have not included any sum for the defalcation account, nor is any sum included in our estimate for that account.

I.—*Expenditure for Stokers Strike.*

59. In our memorandum of last year (paragraph 19), we stated that we disallowed £5000, included in the company's estimate of expenditure for expenses of the stokers strike to be met in 1873, on the ground that, in our opinion, it was an expense chargeable to 1872, and not to 1873.

60. In our inquiry this year it appeared that the sum of £5024 had been expended by the company in 1873 on this account. It was contended for the consumers that this was an improper expenditure in the face of our disallowance, and that the sum of £5024 should be regarded as an asset of the company at the end of 1873. But we think that this contention also is founded on a misapprehension of what we did last year. We did not say or mean that the company would not be entitled to expend £5000 on this account in 1873. Our disallowance merely meant that we refused to take into account this item of contemplated expenditure in arriving at the price of gas, which was to be fixed so as to enable the company to meet their expenditure for 1873 as estimated by us.

K.—*Miscellaneous Expenditure.*

61. The results of investigation are not unfavourable to the company with reference to their expenditure for salaries and wages and under miscellaneous heads.

62. Their accounts for 1873, as compared with those for 1872, show that the following savings had been effected in 1873:—

Salaries connected with manufacture	£312
" " distribution	431
" " management	1614
	£2357
Payments to directors	1584
Total	£3941

In 1874 the salaries are estimated to be less by about £1200 than in 1873.

63. There is a charge on the company for compensation allowances under the various schemes of amalgamation, and for pensions. This charge, not having existed in 1869, has risen from £1277 in 1870 to the estimated amount for 1874 of £13,750, representing somewhat more than ¾d. per 1000 cubic feet of the gas to be sold (as estimated by the company).

L.—*Unaccounted-for Gas.*

64. In our memorandum of last year we observed that in the discussions before us the company were charged with want of due care and management in various particulars; and we specified the principal objections made, one of them being that there was too large a proportion of the gas made by the company wasted by leakage and otherwise. With respect to this objection, we said, it was shown that the proportion of the company's unaccounted-for gas was in excess of that of any other metropolitan gas company. We added that, as regards the amount of unaccounted-for gas, gas companies would be in a better position if they secured a distinction between different kinds of waste, and especially if they kept a record of the quantity of gas consumed at their works and offices, and by the gas examiners, and in other similar ways.

65. It appears that, in consequence of these observations, the attention of the company has been given to this subject during 1873, and they have effected a reduction in the per centage of their unaccounted-for gas through systematic examination, repair, and renewal of meters, and by removing, relaying, and renewing mains and service-pipes, and otherwise. There is still, however, considerable room for saving under this head.

66. In consequence of our observations, the company have also caused meters to be fixed to register the quantity of gas consumed at their works and offices; and for the half year ending December, 1873, the quantity thus registered was—

Common gas	19,442,000 cubic feet.
Cannel gas	6,735,000 "
	26,177,000 "

67. This quantity is equal to 111 cubic feet of gas per ton of coal carbonized, and is 1·2 per cent. on the quantity of gas made. This is a serious deduction from the gas saleable, and we think every effort should be made by the company to keep down consumption of this kind.

68. With reference to the recording, as we suggested, of the quantity of gas consumed by the gas examiners, it appears that the company have not at present placed meters for that purpose, but they state that the quantity consumed at the five establishments of the gas examiners is necessarily very large. We think it important, in the interest of the consumers, that proper means should be taken, in concert with the gas examiners, for accurately ascertaining the quantity consumed in this way.

69. There is a considerable quantity of gas consumed, but not paid for, in connection with the public lighting. The company, in order to insure to each lamp the full supply contracted for, and thus to avoid the consequences of a breach of their contract with the vestry, adjust the burner so as to deliver a quantity exceeding that contracted for by about 10 per cent.

70. The various quantities of gas consumed but not contributing to the gas rental of the company, should, in our opinion, appear, as far as possible, in suitable places in the company's published half-yearly accounts.

M.—*Amalgamation.*

71. We stated in our memorandum of last year, referring to sub-section (2) of Section 68 of the City Gas Act, 1868, that since the passing of that Act the company had amalgamated with five other companies, and that they had in contemplation amalgamation with one more company. That contemplated amalgamation has not been carried into effect.

72. The Legislature appear to have adopted the policy of amalgamation in the interest of the consumers, but it has not been shown that hitherto any very marked benefit has accrued to the consumers therefrom.

N.—*Management and Manufacture.*

73. The arrangements of the company relative to the purchase of coal and the sale of coke are of essential importance, in the interest of the consumers. It appears to us, therefore, that the company ought to pay the most careful attention to these branches of their operations, and particularly to secure systematic information respecting the state and prospects of the coal market.

74. The company state that the quantity of gas sold by them per ton of coals carbonized in 1873, compared with 1872, shows an increase of 280 cubic feet per ton. This, on the total quantity of coals carbonized, 485,750 tons, is equal to 136,010,000 cubic feet, which quantity, at the average price of 4s. 9d. for 1000 cubic feet, produces £32,302. The company estimate a further increase of sale in 1874 of 140 cubic feet per ton. A large proportion of this increase of sale is due to improvement of manufacture; but it appears to us that the yield of gas per ton might still be increased.

75. It would be of great advantage if the company, when a favourable opportunity offers itself, were to dispose of works which are unproductive during parts of the year, or which are only in part occupied for productive purposes, and the sites of which are of large value.

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76. Acting on the views we have indicated in the foregoing parts of this memorandum, and supposing no increase in the price of gas, we estimate for 1874—

The gross income of the company (including the surplus of 1873) at	£814,418
The expenditure at	739,774
Leaving as net income	£74,644

77. This amount is applicable to meet the charge in 1874 for interest on loan capital, and for dividend on share capital, and for insurance-fund, which charge is as follows:—

Interest	£ 34,682
Dividend	271,500
Insurance fund	31,500
Total	£337,682

78. Then from that charge	£337,682
Deducting the net income	74,644
We find the difference to be	£263,038

79. This sum of £263,038 is the deficiency of income for 1874, as estimated by us (being less by £26,610 than the company's estimate of deficiency), which we are required by the Acts of Parliament to supplement by means of an increase in the price of gas.

80. The quantity of 16-candle gas to be sold in 1874, as estimated by us, is 3,236,337,000 cubic feet. If 1s. 3d. were added to the initial price of 3s. 9d., making 5s., the additional produce would be £202,271.

81. This addition of 1s. 3d. would be proportional to an addition of 1s. 6¾d. to the price of 20-candle gas. The quantity of 20-candle gas to be sold in 1874, as estimated by us, is 769,697,000 cubic feet. If 1s. 6¾d. were added to the initial price of this gas, 4s. 8½d., making 6s. 3d., the additional produce would be £60,132.

82. These two additional amounts, namely

	£202,271
and	60,132
together make	£262,403

while the estimated deficiency on the ordinary revenue is £263,038.

83. Therefore, leaving the actual illuminating powers unaltered, we have fixed the maximum prices as before stated, those being prices which are, in our judgment, calculated to yield to the company, with due care and management, a dividend in 1874 (after allowing for the surplus of 1873), attaining as near as may be, but not exceeding, the rate of dividend allowed on the share capital of the company, and to make up the insurance-fund, and being prices not exceeding the maximum prices prescribed by the Metropolitan Gas Act, 1860, that is to say, 5s. 6d. for common gas, and 7s. 6d. for cannel gas.

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84. The prices which the company asked for were 5s. 1½d. for 16-candle gas and 6s. 4½d. for 20-candle gas, for 1000 cubic feet. They stated that the price per 1000 cubic feet required to meet the charge for capital were, according to their estimates of that charge and of the quantity of gas to be sold, as follows:

For interest on loan capital	2·16d.
For dividend on share capital	16·32
For insurance-fund	1·89
Total	20·37d.

The difference between this sum and the respective prices asked for may be regarded as representing the cost of manufacture and of distribution and general expenses, which then would be, according to the company's estimates:

For 16-candle gas	41·13d.
For 20-candle gas	56·13

85. In our estimates, the corresponding figures are as follows:

For interest on loan capital	2·08d.
For dividend on share capital	16·26
For insurance-fund	1·89
Total	20·23d.
For cost of manufacture and of distribution and general expenses:	
For 16-candle gas	39·77d.
For 20-candle gas	54·77

86. The great increase of price of gas which we find ourselves compelled to allow, notwithstanding that the price of coal has fallen and appears likely to continue to fall, is mainly attributable (apart from questions of capital), to two facts: (First) a gas company, in order to secure themselves from possible failure in supply of coal for their manufacture, are obliged to make contracts a long time forward for delivery of the requisite supply, and therefore are not in a position to obtain more than a partial and deferred benefit from a fall in the price of coal; (Secondly) when the price of coal falls, the price of coke (as a competing kind of fuel) also falls; and as a gas company dispose of their coke, to a considerable extent, by sale in small quantities for ready money, a fall in the price of coke affects them in full and immediately, in proportion to the extent of their sales of coke in that mode.

FRANS. S. REILLY.
WM. ODLING.
March 31, 1874. W. P. PATTISON.

AWARD.

In the matter of "The City of London Gas Act, 1868," and in the matter of "The Gaslight and Coke Company's Act, 1868," and in the matter of "The Gaslight and Coke Company."

The Certificate of the Commissioners appointed by the Board of Trade on an application of The Gaslight and Coke Company for a revision of the scale of illuminating power and price of gas for the year 1874.

WHEREAS the Board of Trade, by minute dated the 9th day of January, 1874, by virtue of the authority conferred on them by "The City of London Gas Act, 1868," did appoint us, the undersigned, to be commissioners for the purpose of revising the scale of illuminating power and price of the gas supplied by The Gaslight and Coke Company for the current year;

And whereas we have heard The Gaslight and Coke Company and the Corporation of the City of London and the Metropolitan Board of Works, by their respective counsel, agents, and witnesses;

And whereas "The City of London Gas Act, 1868," contains the following enactment (section 68), which, by "The Gaslight and Coke Company's Act, 1868," is applied and extended to the whole undertaking of that company, and to their whole district for supply of gas—namely:

"68. In fixing the illuminating power and price for any company for any year, the commissioners shall observe the following rules:—

1. They shall fix such an illuminating power and such a price as shall be calculated to yield to the company, with due care and management, a dividend in that year (after allowing for the excess or surplus, if any, carried in the then last preceding year to the credit of the divisible profit and to the insurance-fund of the company), attaining as near as may be, but in no case exceeding the rate of £10 per centum per annum, and to make up the insurance-fund authorized by this Act to be made up.
2. They shall take into account any saving or economy which they shall be of opinion might have been effected by amalgamation of the companies, or any of them.
3. They shall not fix, in any case, an illuminating power lower, or a price higher, than the minimum of illuminating power and maximum of price prescribed by the Act of 1860.
4. Subject to the foregoing provisions, they shall fix the illuminating power as high, and the price as low, as circumstances admit."

Now we hereby certify that, by virtue and in exercise of the authority vested in us under "The City of London Gas Act, 1868," as applied and extended by "The Gaslight and Coke Company's Act, 1868," and in terms of those Acts, we have fixed, and we do hereby fix, for The Gaslight and Coke Company, the illuminating power and price of gas for the year 1874, as follows, that is to say:—

1. The gas (except cannel gas) supplied by The Gaslight and Coke Company shall be of an illuminating power of not less than 16 candles, and the maximum price chargeable for this gas, as on and from the 1st day of January, 1874, shall be at the rate of 5s. for 1000 cubic feet.

2. The maximum price chargeable by The Gaslight and Coke Company, as on and from the same day, for cannel gas of an illuminating power of not less than 20 candles, shall be at the rate of 6s. 3d. for 1000 cubic feet.

FRANCIS S. REILLY.
WILLIAM ODLING.
Dated this 31st day of March, 1874. W. P. PATTISON.

GLASGOW NEW GAS-WORKS.

The opening of the Corporation New Gas-Works at Dawsholm, Maryhill, took place on the 31st ult., and, as we learn from the Glasgow papers, an official inspection of the undertaking was made on the occasion by the Lord Provost (Sir James Watson), magistrates and members of the council, and a number of other gentlemen connected with the district.

For a long time the city of Glasgow was supplied with gas by two companies, the—"Glasgow Gaslight Company," and the "City and Suburban Gas Company of Glasgow."

These companies finding it imperative, in order to meet the demands of a large and steadily growing community, that they should increase their capital, so as to allow them to enlarge their works, application was made to Parliament in 1869 for the requisite powers. The subject of the corporation taking over the gas-works had frequently been mooted, and when it became known that the companies were contemplating the enlargement of their works, it was thought the proper time had arrived for carrying out such a scheme. Accordingly the necessary steps were taken in the matter, a special Act of Parliament was obtained, and the result has been thoroughly satisfactory. After acquiring the works, the corporation placed them under the charge of Mr. William Foulis, their present engineer, who, with a very extensive experience in such matters, both in this and other countries, has, by the results obtained, proved himself admirably qualified for the responsible position.

The old works have been thoroughly renovated, and improvements made at them so great and important as to almost amount to a revolution in the manufacture and supply of gas. At Dalmarnock the whole of the iron retorts have been replaced by fire-clay ones, the latter having been found to be more useful. A complete set of new and large purifiers were introduced, and an extensive gasholder, capable of containing a million and a quarter cubic feet of gas, has been erected, while a tank is ready for the reception of another holder of similar dimensions. Lines of rails have been laid down in the works for bringing the coals into the stores. In the Tradeston works, a new gasholder has also been erected, and a great part of the piping throughout the city replaced. By these means the productive power of the work is now increased from about 6,500,000 to 9,000,000 cubic feet in the 24 hours.

Having been found unsuitable in many respects, it has been resolved to abandon the Townhead works as soon as the new works at Dawsholm can supply a sufficient quantity of gas. The most important portion of the corporation's mission, however, has been centred in the erection of the new gas-works which were inspected at Dawsholm on the 31st ult., and which can in every way compare favourable with any similar work in the kingdom. It could scarcely have been possible to have secured a site with better natural advantages. The ground occupied by the works extends to about 22½ acres. On the one side of it runs the river Kelvin, and on the other the Forth and Clyde Canal, and the remaining boundaries are the Helensburgh branch of the North British Railway, and the junction of the Stobeross Railway. The portion of the ground lying along the side of the Kelvin is a level haugh or holm, and did not require much preparation, but the part beside the railway consisted of a huge bank of clay resting on hard rock, which had to be excavated. It was in this locality that the operations were first commenced, and here also the first gasholders have been set down. The excavations have been carried to a depth on a level with some of the lowest-lying streets in the city, so that there is a capital rise for the gas.

The works were designed in such a way as that they should form three complete sections, each of which acts independently of the others. One of these sections has been finished, and a thorough conception of the magnitude of the works was readily gathered from the inspection made on the 31st ult. The retort-house is very spacious, being 588 feet long, with roofs of 70 feet span, and contains about 540 retorts—one-third ofthe number which will ultimately be in use—all of fire-clay. Advantage has been taken of the diverse means of communication for introducing the coal waggons directly into the stores. The trucks are run from the lines on to a railway constructed on a wooden platform above the stores, and their bottoms open and allow the coals to descend without any manual labour. Provision will ultimately be made in this manner for receiving about 1000 tons of coal in the 24 hours. A couple of machines, invented and patented by Mr. Foulis, and worked by hydraulic power, for charging and drawing the retorts, attracted a great deal of attention, more particularly as there is every reason to believe they will be a great success, and be the means of effecting a saving of labour of about 50 per cent. The waste water from the front of the drawing machine extinguishes the coke as it falls into the receptacles beneath. The condensers are large annular ones, 32 feet in height, and so formed that a double air current is available for cooling the gas. The exhausters are of a novel description, and are patented by Mr. Foulis. Hydraulic cylinders are used for raising the tops of the purifiers, which are 16 in number. Meters having a drum of 15 feet in diameter, and capable of passing about 120,000 cubic feet of gas per hour, have been manufactured for the works by Messrs. R. Laidlaw and Son, of Edinburgh and Glasgow. Provision is made in the general plan of the works for the erection of six gasholders, to contain 1,250,000 cubic feet of gas each. Three of these are now ready, and have been each hung in the usual manner on 16 cast-iron columns upwards of 65 feet in height, resting on a base of 5 feet 6 inches square. The outside holders are 160 feet in diameter, and 30 feet deep, and the inside holders are 157 feet 8 inches in diameter, and 30 feet deep. For the purpose of utilizing the coal tar and spirit, a chemical work has been built. Steam pumps are used for conveying the liquid from the gas-works to the chemical manufactory.

When the Dawsholm works are completed the present productive power will be doubled, so that the supply of gas obtainable will be something like 18 million cubic feet in the 24 hours. The estimated cost of the works is upwards of £200,000.

On the occasion of the official inspection, the Lord Provost and party visited the various departments of the works in succession; some of the ingenious appliances in the works were seen in operation; and interesting descriptions of what was thus witnessed were supplied by Mr. Foulis. After an inspection, which continued for nearly two hours, the company sat down to a sumptuous dinner in one of the testing-rooms, the Lord Provost in the chair. The usual loyal toasts followed, and then the toast of the day, "The Corporation Gas undertaking" was given.

The Lord Provost, in proposing it, said: From what we have seen to-day, there can be no doubt that this is an undertaking of great importance. Indeed, I believe that few us, before coming here, had an adequate idea of the extent of the Maryhill Gas-Works. The inspection we have made must have proved to all of us, in a distinct and emphatic way, the value of the services of our excellent manager, Mr. Foulis. It must also have shown us the able manner in which the contractors have done their work; and it must likewise have made clear to us that there is a degree of careful management in connexion with the whole concern that is most deserving of our commendation. It was striking to find, in going over the works, that what was at one time mere refuse—the ammoniacal liquor—is here converted first into tar, then into naphths, and then into oil and pitch; and that these now produce an important revenue to the corporation. You must all have been struck, also, with the manner in which the retorts are filled by a self-applying apparatus, the invention of Mr. Foulis. We saw the old plan and the new of filling the furnaces—the former by manual labour and the latter by machinery—and I think there can be but one opinion, that a great deal of human effort has been spared and human comfort promoted by the apparatus here at work. Not only so, but there is a considerable saving of money—a saving of about £500 a year. From the retorts we proceeded to the "scrubbers" department, where the gas is, as it were, washed by water to make it more pure; and from that department we proceeded to the condensers, and afterwards to the purifiers and gasometers. I cannot help congratulating the gentlemen connected with Maryhill. Between the old light and the new light, Maryhill must be the most enlightened burgh in Scotland. I dare say many of you remember the introduction of gas. I recollect when Glasgow was first lighted with it; and I believe that this mode of illuminating great cities will be recorded in history as one of the greatest improvements of the century. Some years ago the lighting of Glasgow, which had been previously conducted by private companies, was taken in hand by the corporation, and in the interval which has since elapsed the increase in the consumption of gas has been something marvellous. In 1863 it amounted to some 684 million cubic feet, while in 1873 it was 1310 million cubic feet. We have added about 5000 consumers year by year, and when you consider that the undertaking you have inspected to-day is only one of five of the corporation gas-works, you will see what a great charge falls to the Gas Committee of the corporation, and I must say that the committee manage affairs with a degree of care and economy that is most commendatory. We have at Townhead a large gas manufactory, which, however, will shortly be abandoned; we have at Dalmarnock 830 retorts, producing 5 million cubic feet of gas per day; we have at Tradeston 440 retorts, producing 2½ million cubic feet, we have at Partick 120 retorts, giving us 600,000 cubic feet; and we have here at Dawsholm 540 retorts, giving us 3½ million cubic feet, with power to make the number of retorts 1500—a number sufficient to supply Glasgow with gas for the next ten years.

The toast having been very heartily responded to,

Treasurer Miller, with whose name it was coupled, responded. He said: It will be in the recollection of most of those present that when the Corporation of Glasgow entered upon the gas undertaking, that undertaking was in a very inefficient condition. When it came into our hands, in 1863, the supply of gas was altogether inadequate to the wants of the great and growing community which we represent. At the period to which I refer, the total producing power of the works in Glasgow was 6½ million cubic feet per day. Then, in addition to the want of sufficient supply, there was great deficiency in pressure, as well as great irregularity throughout the different parts of the city; and the consequence was that there were frequent complaints by the citizens. We were greatly blamed when, in reality, we were doing the best we could with the defective materials at our command. In the circumstances I have indicated, it was a necessity laid upon us to look immediately to an extension of the works we had acquired; and accordingly we set about considering the best means of extending the Tradeston and Dalmarnock works, which were the two most important. The works at Townhead we did not extend, because we intended as soon as possible to abandon them, and because they were old-fashioned in every shape, and it was unprofitable to work them. The works at Partick we did not think it advisable to extend; but we did extend, and extend very largely, those first mentioned, at Tradeston and Dalmarnock. We also found that the quantity of gas which could be contained in the gasholders, when the undertaking was taken over by us, was very limited indeed; it amounted to only 4,400,000 cubic feet, which was no more than sufficient to supply the demands of Glasgow from 8 to 10 hours out of the 24. We saw that this would place us in a very difficult position indeed, should any accident take place; and it therefore became necessary at once to increase largely the gasholder accommodation. Then, again, the deficiency of mains throughout the streets was a source of great trouble and annoyance, preventing the proper flow of the gas from the works to the outlying portions of the town; and we saw that it was necessary, as soon as possible, to increase the dimensions and number of the mains, and, what was of great importance, to connect the various works. All these things were attended to as quickly as possible. But we had not only to consider present wants—we had to look to future wants. Glasgow was advancing and extending, and the consumption of gas was increasing at the rate of 8 or 9 per cent. per annum. We had to look, therefore, at an early period for a piece of ground on which to erect new and large works; and the result of our efforts is to be seen in the works we have inspected to-day. They are a credit to the city of Glasgow, and are nearly the largest in the kingdom. The retort-house, which you all saw, is certainly the largest building of the kind in any gas-work in the country. The producing power of the various works had been increased from 6½ million cubic feet (which was the amount of production when they came into our hands) to 11 millions. Of course, all this has not been done without expense. When the works came to us the total capital that had been expended upon them was £534,000; now the total expenditure of capital amounts to £1,026,000. It has often been said that the cost of the gas must be high, because the expense for interest upon capital at 9 per cent. is so enormously great. That is not the case. The reverse is true. During the companies time their expense for interest upon capital was equal to 10¾d. upon every 1000 feet of gas they produced. What is it now? With the enormous expenditure we have had, and with a large portion of that expenditure still unproductive, the cost for interest upon capital is reduced to about 9d. per 1000 feet. In 1863 the gas produced was 684,490,000 cubic feet; in 1868 it increased to 978,320,000; and in 1873 to 1,310,000,000. Surely, in view of these figures, we have not looked too far before us in making provision for a large and increasing supply of gas—a supply which will be sufficient for at least the next ten years. A great deal has been said as to the quality of our gas. I say that its quality, during all the years the undertaking has been under our charge, has been always the same. It has never changed; there is no reason whatever why we should supply the community with an inferior quality of gas. Mr. Miller added the expression of his regret that the starting of a new private gas company (for whose prosperity he was sure they all entertained the best wishes) had created the very evil which the corporation had desired to get rid of—the duplication of mains through the streets of the different burghs; and concluded by testifying to the zealous part taken in the work by Mr. Foulis, whose health he proposed.

Mr. Foulis briefly and appropriately acknowledged the compliment, and after some further toasts the company separated.

THE NORTHERN COAL TRADE.

(FROM OUR OWN CORRESPONDENT.)

On account of the Easter holidays, there was very little work done at the northern collieries until Wednesday. Since then a very limited business has been done. There are few orders in the market, and what are to hand are keenly competed for by the colliery offices in all branches of the trade. Prices are very irregular, the rates for steam coals range from 12s. to 18s. per ton; the latter is the official quotation for best qualities. But the inquiry for the best sorts is so slack that there is a strong impression upon Newcastle Quayside that the official rates will have to be reduced immediately. There is only a hand-to-mouth demand. The price of gas coals has been considerably affected by the great fall of manufacturing coals, and fair qualities of gas may be bought at from 12s. per ton and upwards. Second-class coals of all kinds, which have been regulated by the state of the iron trade, have greatly fallen in price, and the tendency is still downwards. Coke, also, has fallen very much. Middle-men who are holders of coals, iron, and chemicals, and who have contracts running from January to June, are heavily hit by the collapse of these trades. The coalowners and manufacturers are pressing their goods upon them. They cannot find a market except at a great loss, and, as might have been expected, some houses are severe sufferers. Several classes of chemicals are being manufactured at a loss of 25 per cent. to the maker when he has to go into the open market to sell, and middle-men, if they have to realize, are in an equally unfavourable position. The continental trade is in a very bad position, and there seems a complete col-

lapse of business in Germany at present. There is a very poor outward business to America also, especially for chemicals. The chemical manufacturers have given their men notice of a reduction of 10 per cent. upon their present rate of wages. The reduction of wages in the coal trade is likely to be effected without any serious misunderstanding between the employers and the employed.

During last week little coasting business was done by shipping, and rates, upon the whole, were lower; 5s. 7½d. to 5s. 10d. per ton were the quotations for for vessels to deliver coals at the wharves in London river; £8 5s. per keel to the nearer French ports; and £7 to £8 per keel for the East coast ports.

THE INSTITUTION OF CIVIL ENGINEERS.—The roll of this society, corrected to the 1st inst., contains the names of 15 honorary members, 793 members, 1295 associates and 292 students, together 2395 of all grades. During the past quarter the changes have included the election of 9 members and 69 associates, the transfer of 9 associates to the class of members, and the admission of 23 students; on the other hand, from deaths and other causes, there have been removed from the list 3 members, 20 associates, and 21 students, showing a gross gain of 57 in the three months.

BUENOS AYRES PUBLIC LIGHTING.—The unpleasant question between the gas company and the municipality has come to a crisis, the company intimating its intention of stopping the municipal supply from to-morrow. We hear that representations were made to the Government to-day about the matter. It must never be forgotten that for the last 22 months the municipality has been collecting from householders every month the gas tax, yet has never paid one farthing of the proceeds to the company; there certainly must be some remedy against a corporation guilty of such conduct. It is proposed to sell some municipal property to liquidate the debt. The Chacarita question is equally disgraceful, but in that case the Federal Court afforded relief; the same court ought to be able to afford relief to the unfortunate gas shareholders.—*Buenos Ayres Standard.*

PELOUZE AND AUDOUIN'S CONDENSER.—Since our last issue we have received several communications asking information in respect to a new condenser, the efficiency of which we have already described. The chief point of inquiry has been as to what position it should occupy relatively to the refrigerator now in use, and if the scrubbing process is indispensable. To these inquiries we make the following reply:—The condenser of MM. Pelouze and Audouin differs from the old apparatus, which is indifferently called a refrigerator, a condenser, or a condensator, in that its actual effect is that of condensing all tarry and watery matters contained in gas, but its object is not that of a refrigerator. The old apparatus was specially intended to refrigerate gas, but the condensation of foreign matters effected by it was very incomplete, and only an accidental consequence of the process. It is necessary to continue to use a refrigerator of some kind, for the cooling of the gas is important, and consequently it is better to place the Pelouze condensator beyond the refrigerator. In respect to the scrubber, it is completely useless. The gas-works at St. Germain possess none, and yet the quality of the gas does not in the least suffer from their absence.—*Le Gaz.*

EAST LONDON WATER-WORKS COMPANY.—The half-yearly general meeting was held on Thursday, the 2nd inst. The directors in their report stated that the revenue from water-rates for the last half year exceeded the amount credited in the accounts for the corresponding half year of 1872 by £5745. The expenditure for the maintenance and management of the works showed an increase (compared with the same period) of £2828. The additional cost of coal, accounted for more than half of this amount. The purchase-money for Chingford Mill had been paid; and £5313 expended for additional mains and services, 9393 yards of pipes having been laid. The amount expended on capital account was now £7535 in excess of the receipts, and the difference remained to be adjusted hereafter, by the exercise of the powers already conferred upon the directors by the proprietors. The whole of the company's extensive works were maintained in excellent order and efficiency; the official report of Major Bolton, the water examiner appointed under the Act of 1871, had invariably been of a satisfactory character. The quantity of water pumped during the half year to Christmas last was 3,778,140,036 gallons—corresponding nearly with the quantity pumped during the same period of the previous year. The waste consequent upon the introduction of the constant supply into a district of upwards of 6000 houses had been reduced, and a regular and careful examination of the fittings in the houses would be maintained, by which means the directors hoped that this evil would be fairly subdued. Notice had been given to the proper authorities that the provisions of the Metropolis Water Act, 1871, would be carried out in a further district containing about 3000 houses. This would be subdivided into divisions of about 1000 houses, to enable the company's officers to secure the introduction of proper fittings prior to the commencement of the constant supply. The notice of the Metropolitan Board of Works had been called to the great importance of introducing hydrants for the supply of water for the extinguishing of fires, but no reply had yet been given to the company to their communications upon the subject. The directors recommended that a dividend at the rate of £3 per cent. for the half year on the ordinary stock; of £2 5s. per cent. upon the shares created on the 2nd of April, 1868; and of £2 5s. per cent. upon the debenture stock; all clear of income-tax, be declared payable on the 10th of July next, in the usual manner.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

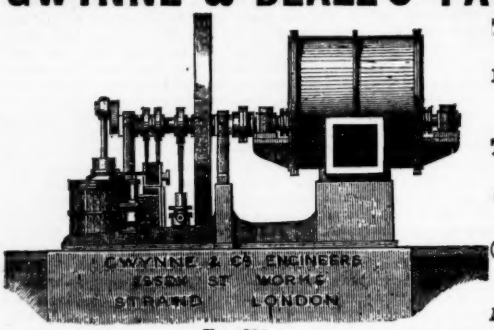

FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

Mr. BEALE,

The eldest Maker, Inventor and Patentee of

GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

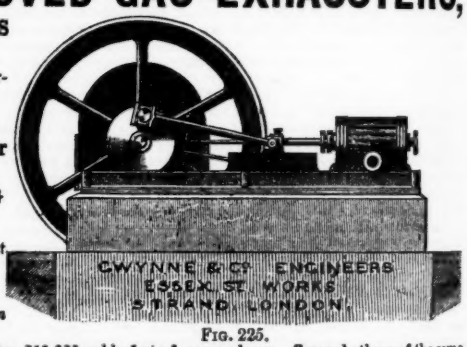

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND CO. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,

CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 cubic feet Patent Gas Exhausters, and many of all sizes.

WANTED, a good second-hand GAS-ENGINE.
Send price and particulars to Mr. JAMES YOUNG, Ironmonger, HULL.

WANTED, a set of Condensers, not less than 8-in.
Forward particulars and price to SECRETARY, Gaslight Company, Kidsgrove, STAFFORDSHIRE.

WANTED, near London, a Working MANAGER, for a Company making about 3 million. Apply, by letter, to M. A., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

TO GAS & WATER ENGINEERS & CONTRACTORS.
THE Advertiser is prepared to undertake the Erection of Gas and Water Works throughout, including the setting of Retorts, fixing of Purifiers, Gasholders, Pumping Machinery, wrought and cast iron Reservoirs and Tanks, the laying of street Main-Pipes, Services, Internal Fittings, &c., either at home or abroad. He is also thoroughly conversant with the working management of both Gas and Water Works, and can give first-class references and testimonials as to ability, experience, &c. He is also prepared to give security for the proper completion of any contract which he may undertake.
Address B. U., 55, Albion Road, DALSTON, E.

ADVANTAGES OF GAS FOR COOKING AND HEATING,
BY
MAGNUS OHREN, A.I.C.E., F.C.S.

For Companies to issue to their gas consumers.
Specimen Copy by post 4d., direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

WANTED to purchase, 5000 to 10,000 tons of GAS COKE. Waggons can be sent to any station for any proportion of above.
Address G. J. EVESON, Gas Coal and Coke Merchant, STOURBRIDGE.

WANTED, by the Advertiser, aged 32, an engagement as MANAGER or MANAGER and SECRETARY of a Gas-Work. Has been 15 years connected with Gas-Works. Understands perfectly the manufacture and distribution of gas in all its branches. Can procure first-class testimonials as to ability, &c.
Address B. Z., care of Mr. William Sugg, Vincent Works, Vincent Street, WESTMINSTER.

WANTED, by the Bahia Gas Company, Limited, a competent ENGINEER for their works at Bahia. He must have a thorough knowledge of the manufacture and distribution of gas, particularly the setting of retorts, and the general routine of Gas-Works. Security required to the extent of £500. Terms £600 per annum, with unfurnished house, gas, and coke.
Address, with testimonials (copies only), and references, stating age, number of family if married, and in what time the applicant can proceed to Bahia, to the SECRETARY, Bahia Gas Company, Limited, 10, Coleman Street, LONDON, on or before the 15th inst.

VINCENT'S
PATENT IMPROVEMENTS
IN
Apparatus for Manufacturing Gas.
Particulars to be obtained by application to—
MR. LAYARD JONES,
ENGINEER,
25, OLD BROAD STREET, LONDON, E.C.

WANTED, by a practical man, a situation as MANAGER of a Gas-Work, where the make is from 10 to 30 millions. Uses the photometer. Unexceptionable testimonials as to character and abilities.
Address G. L., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

THE Advertiser, aged 23, requires a situation as ASSISTANT INSPECTOR or COKE CLERK, or in any light capacity.
Can test dry or wet meters. Willing to be useful. Five years in a London Company. Good testimonials.
Address METICUS, 3, Walton Street, CHELSEA, S.W.

EAST LONDON WATER-WORKS COMPANY.
AN Assistant Engineer is required by this Company. He must be prepared to devote the whole of his time to the service of the Company, and will be required to reside on the premises at Old Ford. A practical knowledge of Cornish engines is desirable. A salary of £500 per annum will be given.
Applications, stating age and previous employment, with testimonials, may be addressed, marked "Private," to the SECRETARY, at the Office, 16, St. Helen's Place, LONDON, on or before the 11th of May next.

ROBUS, SIMPSON, & ROBUS,
(Late of the Crystal Palace District Gas-Works, Sydenham, and the New City Gas-Works, Montreal, Canada,)
GENERAL CONTRACTORS & RETORT-SETTERS, FITTERS & MAIN-LAYERS.
RETORTS SET ON THE LATEST IMPROVED PLAN.
Retort-Setters sent to all parts of Europe and America.
Address, J. and H. ROBUS,
BELL GREEN, CATFORD, KENT.

GEORGE THORNELOE,
GAS ENGINEER,
12, QUEEN VICTORIA STREET,
LONDON, E.C.

WANTED, Two good Draughtsmen, well up in gas apparatus work.
Apply, by letter only, stating full particulars, to GEORGE THORNELOE, Gas Engineer, 12, Queen Victoria Street, LONDON, E.C.

WANTED, a situation as Manager, Assistant, or Secretary. Good testimonials, references, and security.
Address H. H., care of Mr. Pike, Buckhurst Hill, ESSEX.

WANTED, by the Clayton, Allerton, & Thornton Gas Company, two leading STOKERS. They must be steady men with good references, and used to engine and exhauster. Wages 37s. 4d. per week.
Apply, on or before Tuesday, the 21st of April, to JOHN NIVEN, Manager.
Clayton, near Bradford, April, 1874.

WANTED, for a Gas-Work a few miles from London, a steady, active man as STOKER. He will have one labourer under him during the summer, and two during the winter months. He must understand the working of clay retorts and the management of an exhauster. Wages 29s. per week.
Address E. M., care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Water Company, in a town of 3500 inhabitants, a competent person to act as Secretary, Collector, and Working Manager.
Applications (by letter only, prepaid) not later than the 10th of May, with copies of testimonials and salary required, to be forwarded to Mr. CLARK, Stamp-Office, CHEPSTOW.

A Practical Engineer and Draughtsman, of 18 years experience in the erection of Gas Apparatus, also manufacture and distribution of Gas, is open for a SITUATION at once, either at home or abroad. Testimonials will be forwarded on application.
Address, A. H., 5, Bromley Cottages, High Street, Bromley-by-Bow, LONDON.

THE Falmouth Gas Company, in consequence of alterations on their works, have for SALE 12 8-in screw wedge GAS-VALVES, in excellent condition; also, several surplus Lowmoor Iron Tank Bands (suitable for a tank 52 ft. in diameter), weighing about 5 tons.
Further particulars may be had on application to R. J LUKEY, Secretary.
Dated Falmouth, March 28, 1874.

TO TAR DISTILLERS, &c.

THE Directors of the Windsor Royal Gas Company are open to receive TENDERS for the surplus TAR (about 40,000 gallons per annum) produced at their works, Goswell Road, Windsor, for One, Two, or Three years, commencing on the 1st of June next.
The party obtaining the contract will have to provide a stock of barrels for the removal of the Tar, and bear all expenses incident to cartage, &c.
Tenders to be sent in by the 4th day of May next.
The Directors do not bind themselves to accept the highest or any tender.
By order,
GEORGE CARTLAND, Secretary.
Windsor, April 13, 1874.

GLASGOW CORPORATION WATER-WORKS.

RIVER SUPPLY WORKS.
TO ENGINEERS.

THE Water Committee are prepared to receive TENDERS for the construction and erection of Two HORIZONTAL PUMPING-ENGINES, with double-acting Pumps, Four Boilers, and all necessary suction and discharge pipes, valves, and apparatus. The whole to be of sufficient size and power to raise 7,500,000 gallons of water a height of 65 feet in 21 hours.
The Engines are to be erected on the north bank of the Clyde, about 4½ miles by the river above Glasgow Bridge.
Drawings of the Engines may be seen, and copies of the specification may be obtained, by applying at this Office to the Engineer, Mr. Gale.
Sealed tenders, marked "Tender for Pumping-Engines," and addressed to the Subscriber, will be received at this Office up to Saturday, the 9th of May next.
The Committee do not undertake to accept the lowest or any tender.
By order,
J. D. MAREWICK, Clerk to the Commissioners.
Water-Works Office, 23, Miller Street,
Glasgow, April 4, 1874.

GAS PLANT FOR SALE.

THE North Staffordshire Railway Company offer the following GAS PLANT FOR SALE, viz :—
15 15-in. Circular Mouthpieces, Lids and Crossbars.
15 6-in. by 3-in. Taper Ascension-Pipes and Bridge-Pipes.
3 Lengths of Hydraulic Main, 14-in. D shape, 7 ft. 6 in. long each.
6 Furnace Doors.
Set of 6-in. Pipe Condensers, with bottom box, eight pipes 21 ft. high.
Square washer.
2 Purifiers, 8 ft. 6 in. by 6 ft. 6 in. by 4 ft. deep, with wrought-iron lids.
2 Wrought-Iron Purifiers, 4 ft. 6 in. by 4 ft. 6 in. by 4 ft. deep, with wrought-iron lids.
12 6-in. Screw Valves.
Gasholder, 30 ft. by 16 ft., with 9 columns and cast-iron girders.
Gasholder, 30 ft. by 16 ft., with 3 columns and wrought-iron tie-rods.
Station-Meter, with 6-in. bye-pass, capable of passing about 3000 feet per hour.
The whole can be seen, and further information obtained, on application to M. JOHN M. MILLAN, Engineer, Gas Office, Stoke-upon-Trent.
Tenders for the above Plant to be forwarded to the SECRETARY, North Staffordshire Railway Company, STOKE-UPON-TRENT.
Stoke-upon-Trent, April 11, 1874.

TO SHIPPERS OF GAS COAL.

FOR SALE—Gas Coal of the very "Highest Quality."
Apply at COATS IRON-WORKS, COATBRIDGE, N.B.

SLIDE-VALVES.

FOR SALE—14 12-in. and 5 10-in. Slide- VALVES with outside racks. They have been thoroughly re-fitted, and are equal to new. A low price will be accepted to effect a clearance.
Apply to JAMES WATSON, Engineer and Manager, Crystal Palace District Gas Company, LOWER SYDENHAM, S.E.

FOR SALE, and ready for immediate delivery by the Barnstaple Gas Company, about 35 ft. of 12-in. Hydraulic Main, in five lengths; 15 ft. of 16-in. Hydraulic Main; cast-iron Stools for ditto; 21 15-in. Mouthpieces; a number of Ascension-Pipes, Bridges, and Dips; together with a quantity of odd castings suitable for a small work.
Feb. 26, 1874.

RYDE GASLIGHT COMPANY.

FOR SALE, and ready for immediate delivery, 170 LAMP COLUMNS and sundry brackets, with cradles and lamps complete.
The above can be inspected and particulars obtained on application to the undersigned.
GEORGE GARNETT, General Manager.
Gas-Works, Ryde, March 31, 1874.

CORPORATION GAS-WORKS, BARROW-IN-FURNESS.

FOR SALE—A set of Four Dry Lime PURIFIERS, 8 ft. square, four layers (wood sieves) in each, galvanized iron covers, hydraulic centre-valve, with 9-in. connexions, and lifting crane complete.
Also TWO CAST-IRON SCRUBBERS, 18 ft. high by 4 ft. diameter, top platform, with wrought-iron railings, wrought-iron ladder, 9-in. connexions, including four Donkin's valves complete.
The above are in good working order, and are only disposed of in consequence of enlargement of works.
An inspection of the above plant, and offers to purchase, will be duly considered.
JOHN LEWIS, Manager.
Feb. 5, 1874.

PADIHAM GASLIGHT AND COKE COMPANY.

TENDERS FOR PURIFIERS.

THE Directors of the above Company invite TENDERS for 4 PURIFIERS, 10 ft. 6 in. square.
Particulars may be obtained on application to the Manager, at the Gas Offices, Padiham, Lancashire.
Tenders, addressed to the Chairman of the Company, to be sent in on or before Thursday, the 23rd of April, 1874.
By order,
Padiham, April 7, 1874. J. R. SMITH, Manager.

TORQUAY GAS COMPANY.

THE Directors of the above Company are prepared to receive TENDERS for the construction and erection of a new TANK and GASHOLDER at their works, Preston, in the parish of Paignton.
The plans, specifications, and form of contract may be seen, and further particulars obtained from Mr. James Greenfield, at the works as above, and tenders stating the price for the tank and the gasholder, separately or together, are to be sent to the undersigned on or before the 15th of April next.
By order,
J. KITSON, Secretary.
1, Vaughan Parade, Torquay, March 30, 1874.

PONTYPRIDD GAS-WORKS.

TO PIPE FOUNDERS.

THE Directors of the Pontypridd Gas Company, Pontypridd, Glamorganshire, solicit TENDERS for the supply and delivery of about 11,000 yards of Cast-Iron common Socket and Spigot MAIN-PIPES, with all irregular castings necessary in laying the same.
Copies of the specification, with conditions of contract and form of tender, may be obtained on application to Mr. John Lees Cocker, Gas-Works, Merthyr Tydfil (the Company's Engineer).
Sealed tenders, endorsed "Tender for Main-Pipes," to be forwarded to Montague Grover, Esq., Solicitor, Cardiff, on or before Saturday, the 2nd day of May next.
The Directors do not undertake to accept the lowest or any tender.—By order,
MONTAGUE GROVER, Secretary.
Cardiff, April 10, 1874.

THE RADCLIFFE AND PILKINGTON GAS COMPANY, RADCLIFFE, near MANCHESTER.

TO GAS ENGINEERS, IRONFOUNDERS, &c.

THE Directors of the above Company are prepared to receive TENDERS for the erection of NEW WORKS.
Plans and specifications must accompany each tender. A ground plan of site can be seen at the present works, Sion Street, Radcliffe, and any other information obtained from Mr. D. Brandwood, the Company's Manager and Secretary.
They are also prepared to receive TENDERS for about 520 yards of 12-in. cast-iron PIPES; 790 yards of 10-in., and about 540 yards of 8-in.
Specifications and conditions can be had from Mr. D. BRANDWOOD, the Company's Manager and Secretary.
The Directors do not bind themselves to accept the lowest or any tender.
Gas-Works, Sion Street, Radcliffe, April 6, 1874.

ROBERTSBRIDGE GAS COMPANY, LIMITED.

MESSRS. THOMAS & SON have been instructed by the Liquidators of the above Company to offer FOR SALE BY PUBLIC AUCTION, at the "George" Hotel, Robertsbridge, on THURSDAY, the 23rd of April, 1874, at Three for Four o'clock in the afternoon, in One Lot, subject to such conditions as shall then be produced, the recently constructed and complete GAS-WORKS, with the buildings, fixed and moveable plant, machinery, mains, pipes and lamps, and about 1 r. 31 p. of land upon which the gasometer and buildings are erected.
May be viewed, and further particulars had, by applying to Mr. SHEPPARD, Solicitor, BATTLE; or the AUCTIONEERS, BEXHILL (postal address, Sidley, Battle).

STOCKPORT BOROUGH GAS-WORKS.

TO TAR AND AMMONIA DISTILLERS.

THE Gas Committee are desirous of receiving TENDERS for the purchase of TAR and AMMONIACAL LIQUOR produced at their works for the term of One year, or more if necessary, commencing on the 1st day of July next. The tenders to state price per ton for Tar, and price per ton for Ammoniacal Liquor, and delivered, addressed to the Chairman, on or before Wednesday, the 22nd day of April, endorsed "Tender for Tar," &c.
Particulars as to quality and quantity may be obtained on application at the works.
By order of the Directors,
JAS. JACQUES, Engineer and Manager.
Millgate Offices, Stockport, April 10, 1874.

TO COAL MERCHANTS, SHIPOWNERS, & OTHERS.

THE Directors of the Torquay Gas Company are prepared to receive TENDERS for the supply of about 4000 to 5000 tons (or such other quantities as may be agreed on) of good and approved GAS COALS, about 600 tons per month, to be delivered during June, July, August, September, and October, and the remainder at the rate of about 400 tons per month until the contract is completed.
The Company to have the option from time to time of taking either of the Coals specified in the contract, and also of having the same delivered at Torquay, Paignton, or Dartmouth.
Tenders to state the price of the Coals and freight separately and together, and also delivery into the gas-works free of all charges.
Payment by cash for freight on delivery, and by three months bills for the Coals.
Further particulars to be obtained from Mr. Greenfield, the Manager of the Company, at the Works, Preston, Paignton; and tenders to be sent to the undersigned on or before the 15th day of April next.
By order, J. KITSON, Secretary.
Torquay, March 30, 1874.

RICHARD THOMAS & CO.,
40, GRACECHURCH STREET,
Manufacturers of
EWELL FIRE-BRICKS, CLAY, AND CEMENT.
Warranted the best quality.
WORKS AT EPSOM.

BRONNER'S PATENT GAS-BURNERS give 99 per cent. of light, as compared with 27 per cent. given by ordinary burners, with equal consumption of gas.—*Vide* "Gas Referees Report," published June, 1869.
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By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.
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The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

TO GAS COMPANIES, ENGINEERS, MANAGERS, &c.

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EXTENSIONS AND ALTERATIONS,
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To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

MR. NORWOOD EARLE, late of the Dover Gas-Works, is prepared, after 17 years experience, to undertake the duties of SURVEYOR to Gas Companies and Corporations in all matters relating to the Distribution of Gas and Gas Testing. Contracts entered into for the Survey of Mains, Services, Public Lamps, &c., in order to reduce the per centage of unaccounted-for gas to the lowest possible amount.

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TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

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REGISTRATION OF DISTRIBUTORY PLANT.

The forms for this purpose are to illustrate the Paper on Distribution of Gas, read at the Edinburgh Meeting of the British Association of Gas Managers. By the use of the synopsis the whole of the out-door plant may at once be seen, with all matters pertaining to the same.

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South Shields.

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FOR REMOVING THE
CARBONACEOUS INCRUSTATION FROM GAS-RETORTS.

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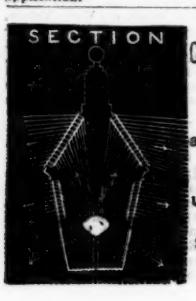

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By THOMAS NEWBIGGING, A.I.C.E.

The scope of this work is apparent from its title. The First Edition, published a year or two ago was eagerly sought for, and has been now for some time out of print. The favourable reception accorded to it sufficiently proved that it supplied a generally acknowledged want in the profession. The New Edition is published in fcap. 8vo., morocco, gilt. The work has undergone careful revision; much new matter has been added; and its form altered to suit alike the pocket and the desk. Every effort has been made by the Editor to increase its usefulness and render it worthy of the position it aspires to fill—that of an indispensable companion for all persons engaged in gas making.

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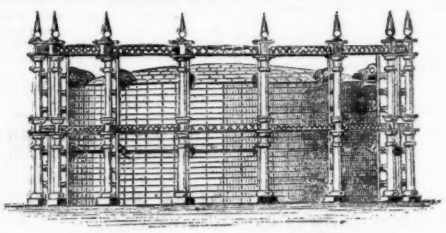

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1862.

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Reference is kindly permitted by the Engineers of the City of London, Commercial, London, and Surrey Consumers Gas Companies, who pronounce it the best Paint known for their purposes.

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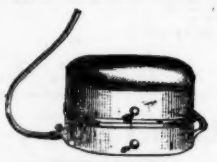
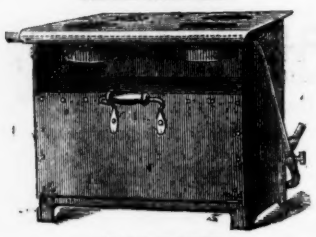
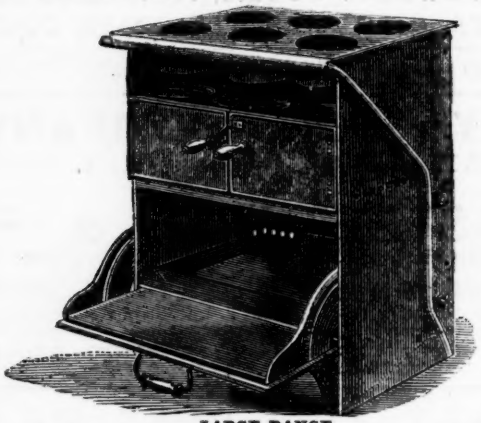


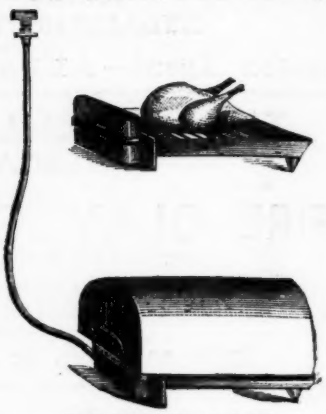
TABLE ROASTER.



SMALL RANGE.



LARGE RANGE.



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A 7-lb. JOINT ROASTED TO PERFECTION FOR ONE HALFPENNY.

SELECTED BY THE COMMISSIONERS FOR THE ANNUAL INTERNATIONAL EXHIBITIONS, 1871 & 1873.

A pennyworth of gas, perfectly consumed and economized as it is under this Patent, does as much work as six pennyworth of coal. The peculiar arrangement of cannel fishtails in a chimney secures freedom from smoke even with the richest gas, and a positive immunity from every trace of smell. The simplicity in use is so great that no experience is required. Roasters from 12s. 6d. to £1 5s. Complete Ranges at £2 4s. for small families; £3 10s. for ordinary establishments; and £6 6s. for a Range equal in power to a large Kitchener. Estimates given for fitting up Hotels, Restaurants, and large Establishments.

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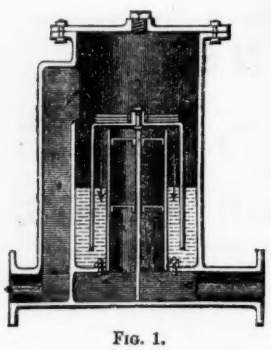

FIG. 1.

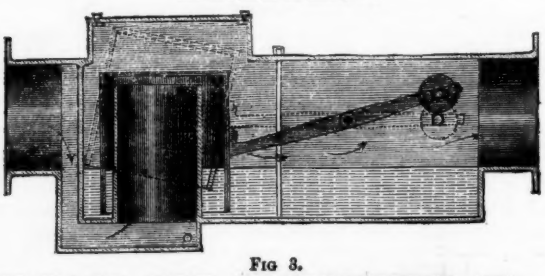

FIG 3.

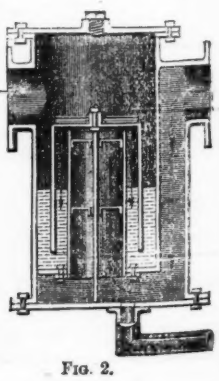

FIG. 2.

BYE-PASS FOR EXHAUSTER (Fig. 1).

This Hydraulic Bye-Pass has been invented for the purpose of supplying to gas companies a cheap, effective, and self-acting valve. It is simple in its construction, cannot get out of order, perfect in its action, can be made to stand any pressure, occupies very little space, and can be adapted to any existing pipes.

Fig. 2 is a Valve similar to Fig. 1, but made to act as a self-acting hydraulic bye-pass for washers, condensers, scrubbers, and meters; the Valve part being *below* the inlet and outlet, so that it may be applied to underground mains. Both Valves can be fitted to existing mains without disturbing them, more than the cutting out of a sufficient length to permit the fitting in of the Valve; after being properly fitted, they will require no further attention.

SELF-ACTING HYDRAULIC SAFETY-VALVE (Fig. 3),

For preventing the back flow of gas from the gasholder, and thereby preventing the possibility of accidents (the great damage and danger to life and property resulting therefrom) through the breaking of pipes, unsealing of purifiers, or any other cause. It is easy and prompt in its action, for upon the forward pressure of the gas ceasing, the bonnet *instantly* closes over the stand-pipe, thereby effectually preventing any return of the gas; no extra pressure is put upon any part of the works by its use, and it can be made to stand any required pressure.

Every information can be obtained, and Models seen, at the Offices of the Company,

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GAS ENGINEERS,

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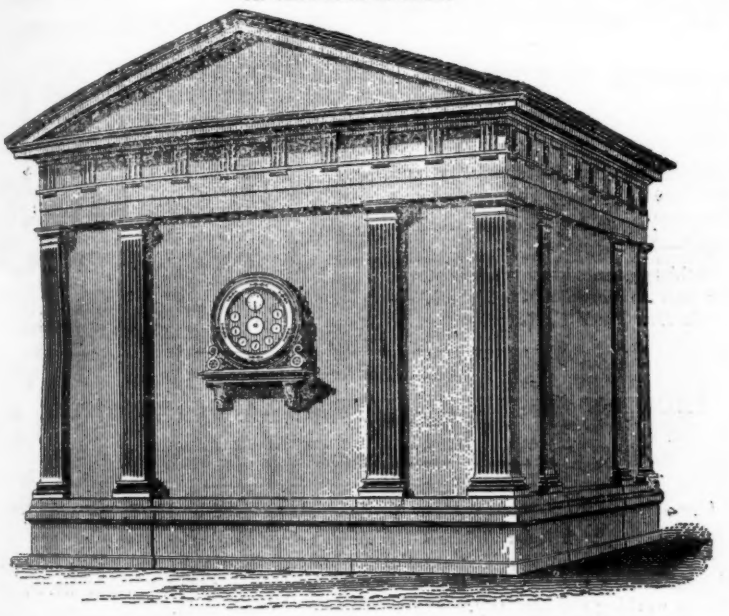
ROUND STATION-METERS,

ON CAST-IRON STANDS.



SQUARE STATION-METERS,

WITH PLANED JOINTS.

GOVERNORS, GAUGES, INDICATORS, MAIN COCKS, &c.

GAS COOKING APPARATUS.

WATER-METERS SUITABLE FOR ALL PRESSURES.

Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

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RETORT SETTINGS, heated by tar without the production of smoke.

STEAM-ENGINES and EXHAUSTERS, separately or combined.

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STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

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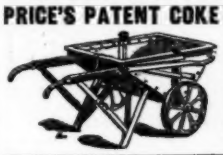

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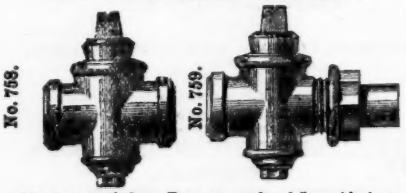

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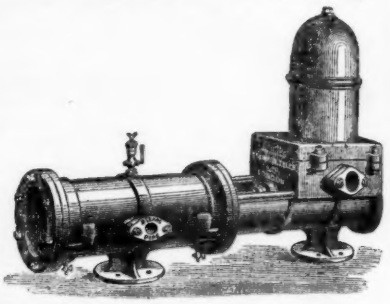

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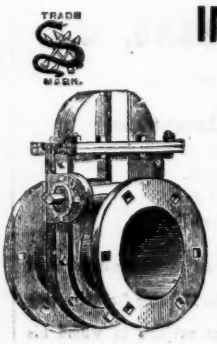

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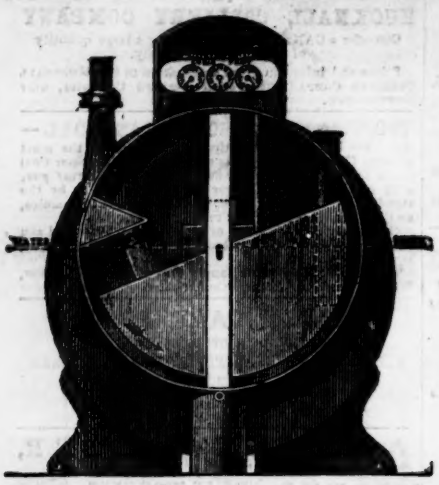

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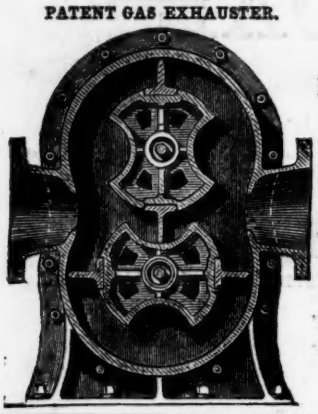

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